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DISEASES CAUSED BY BACTERIA AND FUNGI.

UMENO, S. (1937). **On the Colony-Type of *Streptococcus Equi* II. The Comparison of the Biological Activity, Virulence and Variation between 3 Colony-types.**—*J. Jap. Soc. vet. Sci.* **16.** 250-270 of pt. 1. 13 tables. [Numerous refs.] [In Japanese: abst. from English summary pp. 28-31 of pt. 2].

Previously U. reported [*V. B.* **8.** 5.] that three colony types of *Str. equi* could be recognized. From his earlier observations and those now reported, he concludes that the G type—the original form of *Str. equi*—is unstable, and during prolonged subcultivation tends to change by way of an F_1 phase into an F type, C type colonies being also produced during the process. The C type is more stable than the original G type, but may give rise to the original G type or to F or F_1 types. The F type shows the greatest stability, but may give rise to the F_2 variant. Stock cultures of some years' standing may be changed completely to the F variant, which represents the final phase of dissociation.

Various characters of the variants are discussed, *viz*, length of survival in broth, pH during growth in horse meat broth, final pH in glucose broth, resistance to bile, reduction of methylene blue, susceptibility to the bacteriostatic action of brilliant green, fuchsin, crystal violet, malachite green, rivanol, trypaflavine, methylene blue, methylene green, methyl green and methyl violet, resistance to heat, virulence (the G and F types being of similar and high virulence and the C type much less virulent), toxin production, and hydrolysis of sodium hippurate.

—A. W. STABLEFORTH.

I. TABUSSO, M. E. (1936). Vaccini e vaccinazione anticarbonchiosa. [**Anthrax Vaccines**].—*Clin. vet., Milano.* **59.** 83-95. [10 refs.]

II. DI LELLA, F. (1937). Vaccino "carbozoo" ed il punto d'innesto negli ovini. [**Choice of Site for Vaccinating Sheep with Anthrax Carbozoo Vaccine**].—*Ibid.* **60.** 226-228. 4 tables.

III. SFORZA, M. (1937). Sulla sorte dei germi e delle spore del carbozoo Mazzuchi nell'organismo dei bovini. [**Fate of Anthrax Spores of Mazzuchi's Vaccine in the Body**].—*Azione vet.* **6.** 146-147.

IV. Cancilleri, F. (1936-1937). Vaccinazioni anti-carbonchiose eseguite nell'anno 1932 con un vaccino italiano nel territorio di Butera. [**Anti-Anthrax Vaccination of Cattle in Butera, Italy**].—*Boll. vet. ital.* **33.** 1964-1966 and 1978.

I. Numerous anti-anthrax vaccines have been tested on a large scale during the past 24 years in Peru. T. states that Pasteur vaccine has given unsatisfactory results, whilst attenuated spore vaccine does not confer immunity for more than six months. Aggressin and anaculture are also of little value. The serum-vaccine method is useful in emergency for dealing with an outbreak, but can hardly be considered as an efficient method of vaccination. He considers that " carbozoo " vaccine is of the greatest value and is the vaccine of choice.

II. The author claims that vaccination on the under side of the tail is followed by a less severe local reaction and that there is not such a great reduction in milk yield as when " carbozoo " is injected into other parts of the body.

III. In order to determine the fate of " carbozoo " vaccine in the animal body, calves were killed at varying intervals after vaccination and the distribution of the organism throughout the body determined. In one case only was it possible to recover the organism from the spleen, eight days after vaccination. The intestinal mucous membrane, bile and urine were always sterile. Animals infected with *S. paratyphi* or *Bact. coli* or which had been given toxic doses of quinine, arsenic or morphine, withstood vaccination just as well as animals not so dosed.

IV. Vaccination of large numbers of sheep, goats and cattle has shown " carbozoo " to be perfectly harmless but effective. It produces only a slight general reaction, the temperature never rising above 40°C. The local reaction consists of a slight swelling which quickly disappears. During the first 24 hours after vaccination there is a slight reduction in the milk yield. Pregnancy is not disturbed.—J. A. Nicholson.

Lugomer, V. (1937). Dokaz b. anthracis i precipitinogena u mesu kunica i ovaca cijepljenih vakcinama za jednokratnu vakcinaciju. [*Bacillus anthracis* **and Precipitinogens in the Flesh of Rabbits and Sheep after Single Inoculations of Vaccine**].—*Inaug. Diss., Zagreb.* pp. 20. 4 tables. [4 refs.] [German summary]. [Also published in *Jugoslov. vet. Glasn.* **17.** 183-191].

Sheep were inoculated with a single-dose anthrax vaccine and the fate of the bacilli and the effects of the precipitinogens were investigated.

It was ascertained that both the bacilli and the precipitinogens were present till the 16th day following inoculation with several vaccines that were tested. Bacilli and precipitinogens were found in certain internal organs, but never in the muscles.—B. Oswald (Križevci).

Butozan, V., & Likar, I. (1937). Ispitivanje metoda diagnosticiranja bedrenice kod suhih koža. [**Detection of Anthrax in Dried Hides**].—*Vet. Arhiv.* **7.** 432-437. 3 tables. [5 refs.] [German summary].

A series of dried skins obtained from white mice, g. pigs and cattle were tested for anthrax by both the cold extract precipitation test and the thermo-precipitation test, and the results were compared with those obtained by means of cultures sown from the skins on agar plates. In some cases positive precipitation was obtained from hides which gave negative reactions on agar plates and *vice versa.* —B. Oswald (Križevci).

I. Stenius, R. (1934). Tuberkulosin vastustamista koskevan asetuksen soveltamisesta. [**On the Application of the Law with Reference to the Control of Tuberculosis**].—*Suom. Eläinlääkäril.* **40.** 111-119 and 131-186.

II. Stenius, R. (1937). Nautakarjojemme tuberkuloositilanteesta. [**Bovine Tuberculosis in Finland**].—*Ibid.* **43.** 6-11.

I. On February 27th, 1933, a new scheme for the control of tuberculosis in cattle and swine in Finland was inaugurated. If the animal owner suspects the presence of TB. in his cattle or pigs, he must notify the authorities and the animals are then tested with tuberculin at the expense of the state. If positive reactions are obtained the veterinary surgeon has to say whether the infection is due to the bovine or human type bacillus. [This is decided from the results of repeated tuberculin tests on the herds in question, it having been found that the character of reactions differs in cattle infected respectively with the bovine and human type of tubercle bacillus]. Infected herds are then divided into two groups, those affected with bovine type TB. and those with human type TB. Cattle of the first group are ear-marked, while cattle in the other group are kept from contact with infected cattle and from tuberculous attendants and repeatedly tested with tuberculin. In such circumstances the reactions due to human type infection cease to occur after an interval. The milk from these cows is pasteurized where possible. The procedure of the examining veterinary surgeon and the method of determining the type of infection are described.

A reacting pig must be isolated and must not be used for breeding. If the isolation is not carried out the whole herd is regarded as tuberculous.

II. As far back as 1850, bovine TB. was introduced into Finland from abroad and it was not until 1895 that a beginning was made to control it. In 1896, 4,751 cattle were tested and 26 reacted. In 1899 state control began with the use of Bang's system. The results were good and the percentage of infection fell to about 5. In 1908 control further progressed and in 20 years the percentage of reactors fell to 4. At that point no further reduction took place although the incidence of TB. found at meat inspection became more and more rare (0·02%). When reacting animals were slaughtered there were often no signs of TB. These findings gave rise to closer investigations and S. was able to establish the fact that a great majority of tuberculin reactions in cattle in Finland were due to human type infection contracted from affected cow-men, and that such infection never results in the production of lesions visible in carcasses at meat inspection. When examining herds veterinary surgeons must declare, on the basis of the tuberculin reactions, which type of infection is present in each case. In order to deal with human type infection in cattle, co-operation is sought from the medical authorities and it has been found that cattle herds can be kept free from reactors if no infected person is allowed to be in contact with them.

Plum, N. (1937). Retningslinjerne for Tuberkulosebekaempelsen i Denmark. [**Control of Bovine Tuberculosis in Denmark**].—*Skand. VetTidskr.* **27.** 157-172. [English summary].

In Denmark control of bovine TB. is carried out mainly voluntarily. During the last few years the effect of the control has been greatly increased by the so-called " Destruction Bill "—a measure under which reactors are destroyed. The government now guarantees the farmers a minimum price for the meat of animals slaughtered on account of TB. This meat is destroyed so as not to lower the market prices.

In the control work it is of great importance to remember that in certain circumstances cattle react to the tuberculin test although not affected with TB. Holth [(1932). *Norsk VetTidsskr.* **44.** 196.] stated that an animal infected with brucellosis can give a positive tuberculin test. An animal infected with the avian type or with *Mycobacterium paratuberculosis* can also give a positive reaction. In

a herd which is known to be infected with the bovine type a cutaneous reaction of 3·5 mm. is regarded as positive. In herds which are known to be infected with the avian type or with *M.p.* the animals in which there is an increase in the skin thickness of 2·5 mm. are regarded as free from infection. The animals in which the increase is 3 mm. have to be tested again.—H. BERTHELSEN (STOCKHOLM).

WILSDON, A. J. (1937). **Bovine Tuberculosis in Herefordshire.**—*Vet. J.* **93.** 403-424. 2 figs. on 1 plate, 5 tables, 1 map. [8 refs.]

W. discusses the incidence of bovine TB. in Herefordshire as gauged by tuberculin tests of a limited number of both beef and dairy herds. In beef herds, of 1,216 head tested, 2·79% reacted (5·7% reactors among 473 cows tested) while in dairy herds, of 1,737 head tested, 23·66% reacted (28·75% reactors among 1,127 cows tested).

The lower incidence of TB. in beef herds is attributed to the fact that such herds are maintained on the outdoor system and are self-contained. Where change over from beef to milk production has taken place, the incidence of TB. has risen, due to more intensive indoor management of herds and their recruitment by purchases from dairying districts having a high incidence of bovine TB.

Emphasis is laid on the need for financial encouragement of cattle-rearing as well as of production of designated milk. The article concludes with a critical survey of bovine TB. in different areas in the county, illustrating the highest incidence in purely milk-producing districts.—H. BURROW.

TORRANCE, H. L. (1937). **The Paths of Infection in Udder Tuberculosis with a Clinical Note on the Significance of the Supramammary Lymphatic Gland in the Differential Diagnosis of Tuberculous Mastitis.**—*Vet. Rec.* **49.** 1441-1445.

T. discusses the evidence for haematogenous infection of the udder itself and for lymphatogenous infection of the supramammary gland. He concludes that the vast majority of cases of udder TB. are of haematogenous origin, while most cases of TB. of the supramammary glands are of lymphatogenous origin; cases quoted show that TB. of the supramammary glands does occur without involvement of the udder tissue—both microscopic and biological examination of udder secretion for the presence of tubercle bacilli having proved negative.

The value of palpation of the supramammary glands as a routine measure in clinical examination of dairy cows is discussed and T. concludes that, when the supramammary gland is enlarged and the udder is normal to palpation, the supramammary gland is practically always TB.-infected.—H. BURROW.

I. BOQUET, A., & LAPORTE, R. (1937). Essais de vaccination du lapin contre la tuberculose par des bacilles humains virulents ou atténués, des bacilles bovins atténués (BCG), des bacilles aviaires atténués et des bacilles morts. **[Attempted Vaccination of the Rabbit against Tuberculosis with Virulent or Attenuated Human Tubercle Bacilli, Attenuated Bovine Bacilli (BCG), Attenuated Avian Bacilli and Dead Bacilli].**—*C. R. Soc. Biol. Paris.* **125.** 23-25. [1 ref.]

II. ANANIADES, B., & MATTHAIAKI, E. (1937). Action de la saponine sur la vitalité du bacille tuberculeux et sur l'évolution de la tuberculose expérimentale du cobaye. **[Action of Saponin on the Vitality of the Tubercle Bacillus and on Experimental TB. in Guinea Pigs].**—*Ibid.* 415-417. [2 refs.]

III. Le Chuiton, F., Sabrazès, J., Berge, C., & Pennaneac'h, J. (1936). Exaltation du pouvoir pathogène, pour le lapin, d'un bacille tuberculeux peu virulent, par action *in vitro* et *in vivo* d'extraits acétoniques, méthyliques et de tuberculine. [**Increasing the Pathogenicity for Rabbits of Tubercle Bacilli of Low Virulence by** *in vitro* **and** *in vivo* **Action of Acetone, Methylene, and Tuberculin Extracts**].—*Ibid.* **123.** 581-584. [1 ref.]

IV. Le Chuiton, F., Sabrazès, J., Berge, C., Pennaneac'h, J., & Dubreuil, J. (1937). Impossibilité d'exalter le pouvoir pathogène du BCG par cultures sur milieux imprégnés d'extraits acétoniques, méthyliques et de tuberculine, ainsi que par action de ces produits *in vivo*. [**Impossibility of Increasing the Pathogenicity of BCG by Cultivation in Media Containing Acetone or Methyl Extracts of Tubercle Bacilli or Tuberculin, or by the Action of these Products** *in vivo*].—*Ibid.* **125.** 441-444. [1 ref.]

V. Saenz, A. (1937). Vaccination du cobaye contre la tuberculose avec des bacilles morts enrobés dans l'huile de vaseline. [**Anti-Tuberculosis Vaccination of Guinea Pigs with Dead Bacilli Suspended in Liquid Paraffin**]. —*Ibid.* 495-498. [4 refs.]

VI. Saenz, A. (1937). Sur le mécanisme de l'augmentation de l'allergie produite par l'enrobage des bacilles morts dans l'huile de vaseline. [**The Mechanism of the Increased Allergy Produced by Dead Bacilli Embedded in Liquid Paraffin**].—*Ibid.* 714-717. [7 refs.]

I. A report on the effect of vaccinating rabbits with human, bovine and avian strains either of attenuated virulence or killed by heat or alcohol. BCG, the more virulent human strains and the heat-killed smooth bovine strains appeared to impart some protection in that after testing with virulent bovine organisms generalization was retarded. The rough strains and the other dead strains had only very slight if any protective action.

II. The effect of saponin on the action of tubercle bacilli was examined by two methods. In the first the bacilli were emulsified in 0·25% saponin solution and incubated at 38°C. for intervals of 1-20 days prior to inoculation, and in the second method saponin was inoculated subcutaneously to set up a local reaction into which the bacilli were later injected. Living and dead tubercle bacilli were used, but it was found that the saponin appeared to exert no protective or attenuating action; in fact, more extensive lesions and more rapid death occurred in g. pigs so inoculated, compared with the controls.

III & IV. The authors augmented the virulence of a smooth type of tubercle bacillus of low pathogenicity by the use of acetone extracts, methyl extracts, and of raw tuberculin, either by adding such substances to the Sauton's medium used for cultivation, or by repeatedly injecting them into animals inoculated with the organism. They have repeated such experiments with BCG (type R), and have failed to exalt its virulence for the rabbit or g. pig.

V. Vaccination of g. pigs with dead tubercle bacilli in a liquid paraffin excipient increases the resistance of the animals to a test dose of virulent organisms, in that generalization is markedly retarded. This is particularly well demonstrated when minimal test doses are used. There does not appear to be a complete vaccination, and there is no parallel between the augmentation of allergy and immunity.

VI. The use of an oily excipient for preparing inocula of tubercle bacilli does not markedly retard their diffusion, but does result in a more gradual liberation of the antigen. It is suggested that the augmentation of allergic response which follows the inoculation of dead bacilli in liquid paraffin can be explained by the retardation of the absorption of the antigen.—Norman Hole.

ROSENTHAL, S. R. (1937). Les réactions tissulaires et humorales consécutives à l'absorption du BCG par voie digestive. [**Tissue and Humoral Reactions following Intestinal Absorption of BCG**].—*Ann. Inst. Pasteur.* **58.** 652-676. 11 figs., 2 tables. [17 refs.]

When BCG is given *per os* allergic sensitization to tuberculin frequently fails to develop, and this, together with the fact that tubercle formation has not been observed to follow administration by this route, has caused doubts to be raised over the efficacy of the vaccine when so given. R. has dosed very young g. pigs, and killed them for histological examination at varying periods from one and a half hours to nine months after inoculation. He finds there is a reaction up to the 16th day by the cells of the reticulo-endothelial system, which become increased in number and modified in form, in some instances forming definite nodules. Later the reaction regresses and finally disappears. No humoral reactions were observed, no sensitization to tuberculin and no definite evidence of infection obtained. The serial inoculation of the tissues of such g. pigs did, however, afford a tuberculin sensitization in three instances at the second passage.—N. HOLE.

VAN DEINSE, F. (1937). Etude de la toxi-infection tuberculeuse du lapin dite du type yersin. [**Tuberculosis of the Yersin Type in Rabbits**].—*Ann. Inst. Pasteur.* **59.** 182-196. [Numerous refs.]

The author describes the lesions that develop in rabbits in which the form of disease is of the Yersin type [(1888). *Ann. Inst. Pasteur.* **2.** 245].—H. H. HOLMAN.

BOND, E. W. (1938). **Some Observations on Morphological Forms Found in the Growth of Tubercle Bacilli and the Relationship of Such Studies to Future Research Work.**—*J. Amer. vet. med. Ass.* **92.** 453-470. 10 figs. on 5 plates. [7 refs.]

Sets of ten tubes each of Petroff's medium, aged respectively nine months, six months and three months were used in the experiment. To three tubes in each set, six drops of 10% saline solution were added. All the tubes were inoculated with a suspension of a culture of a very pleomorphic strain of *Mycobacterium tuberculosis* of obscure origin and smears were made after varying periods of incubation varying from 18-228 days. The extra salt apparently made little difference to the culture and the three- and nine-month-old media gave equally good growths, but the growth on the six-month-old medium was comparatively meagre.

The various morphological changes evident in the stained films are described in detail and are compared with the forms seen in tuberculous lesions and also with those evident in frozen sections of colonies grown on Dorset's egg medium.

It is impossible in a short abstract to give a lucid description of the various morphological changes and the interested reader is referred to the original article.
—GWILYM O. DAVIES.

MORGAN, M. T. (1937). Fréquence de la tuberculose humaine due au bacille bovin en Ecosse. [**Incidence of Bovine Type Tuberculosis in Man in Scotland**].—*Bull. Off. int. Hyg. publ.* **29.** 337-341. 3 tables. [14 refs.]

M. gives a brief summary of the results obtained by various workers who have examined cases of TB. in Scotland. In cervical gland TB., FRASER (1912) found that 59% of cases were infected with the bovine type; MITCHELL (1914) found that the percentage was 90. The results of later workers who investigated all clinical types showed that the incidence of bovine type TB. varied from 4·59% in pulmonary TB. to 80·7% in abdominal TB. In general, the incidence of bovine

type infection diminished with age, *e.g.* in children up to five years of age, the incidence was 38·2%; in persons over 15 years of age, the incidence was 23·5%.

Investigation has also shown that bovine type infection is much more common in rural areas than in the towns.—C. McGAUGHEY.

IWANOFF, K. (1936). Beiträge zur Gewinnung von Immunseren gegen hämorrhagische Septikämien (Geflügelcholera und Schweineseuche). [**Antiserum against Pasteurellosis**].—*Z. ImmunForsch.* **88.** 425-430. [8 refs.]

Antiserum against haemorrhagic septicaemia can be prepared satisfactorily in foals by the intravenous injection of large doses of culture which has been killed by heating at 60°C. for one hour. [The author refers to PRIESTLEY's work (below) on pasteurella capsular antigen].—E. J. PULLINGER.

PRIESTLEY, F. W. (1936). **Some Properties of the Capsule of** *Pasteurella septica.* —*Brit. J. exp. Path.* **17.** 374-378. 2 tables. [13 refs.]

P. describes the conditions governing capsule formation around *Past.s.* and the relationship of the capsule to antigenic structure. He chiefly used typical fowl strains of the organism, but all his essential findings were the same for *Past.s.* whatever its source. Capsules could not be stained and were only demonstrable by modified indian ink methods. Virulent strains alone showed capsules, the virulence varying according to the width of the capsule. Capsules were formed on most media at 37°C. after 24 hours, greater or less temperatures being inhibitory. The capsules were heat-labile, being destroyed in one hour at 56°C., and almost instantly at 100°C.

Capsulated strains were more complex antigenically than uncapsulated ones, but both contained a common somatic antigen. The capsules hindered agglutinability. These capsules, therefore, resemble the Vi antigens of the salmonella group as regards their properties and the factors necessary for their production.

—C. V. WATKINS.

SCHOFIELD, F. W. (1935). **Report of a Serious Outbreak among Swine Due to the** *S. suipestifer.*—*Rep. Ont. Vet. Coll., 1934.* pp. 23-24.

In a large piggery about 400 pigs suffered from a septicaemia which caused 75 deaths and of which *Salmonella cholerae-suis* (*suipestifer*), obtained in practically pure culture from the spleen, heart blood, lung and subcutaneous tissue of the ear, is given as the cause. Nearly all cases occurred in pigs about three months old; and the disease did not spread to older pigs in the same piggery nor to piggeries in the immediate vicinity.—E. A. WATSON.

DE LAMARLIÈRE. (1937). Paratyphose, peste et streptococcie du porc dans le département du Pas-de-Calais. [**Swine Paratyphoid, Streptococcus Infection and Swine Fever in the Pas-de-Calais**].—*Bull. Acad. vét. Fr.* **10.** 342-344.

Paratyphoid is an affection of young pigs and where preventive vaccination with an autogenous vaccine is contemplated it should be carried out immediately after birth. The earliest symptom is a yellowish coloration of the skin and it is useless to vaccinate animals showing this feature. Streptococcal infection and swine fever are also responsible for deaths in young pigs.—N. J. SCORGIE.

HINSHAW, W. R., & RETTGER, L. F. (1936). **Cysteine-Gelatin as a Differential Medium for** *Salmonella pullorum* **and** *Salmonella gallinarum.*—*Proc. Soc. exp. Biol., N.Y.* **35.** 44-46. [10 refs.]

The action of 61 strains of *S.g.* and 120 of *S.p.* in cysteine-gelatin was noted. 58 strains of the former isolated from fowls gave a positive reaction. This was

denoted by a yellowish-white turbidity, the nature of which has not been determined. In three cases of *S.g.* turbidity was absent; two of these were isolated from human faeces and the third from a salad. No changes occurred in the medium with any of the strains of *S.p.*—J. E. WILSON.

I. HOHN, J., & HERRMANN, W. (1936). Die Neuordnung der Typhus-Paratyphus-Enteritis-Gruppe nach ihrem Verhalten zu den Ammonnährböden. **[Classification of the Paratyphoid Group by a New Ammonia Culture Method]**.—*Z. Hyg. InfektKr.* **118.** 656-665. [8 refs.]

II. MIESSNER, H. (1937). Enteritisinfektion. Zur Benennung der Enteritisgruppe. **[The Enteritis Groups of Bacteria]**.—*Dtsch. tierärztl. Wschr.* **45.** 177-179. 3 tables. [5 refs.]

III. JANSEN, J. (1937). Ueber die Klassifikation der Typhus-Paratyphus-Gruppe. **[The Classification of the Paratyphoid Group]**.—*Z. InfektKr. Haustiere.* **52.** 11-34. 1 fig., 3 tables. [Numerous refs.]

I. The authors emphasize once again the points in favour of classifying the genus *Salmonella* primarily according to the ability of the various members to utilize ammonia. The groups of organisms obtained in this way may then be subclassified by other biochemical methods. They contend that such a classification is, if anything, more reliable than the antigenic one, complicated as it is by the smooth-rough and group-type variations.

II. A brief discussion of the biochemical tests used for separating the *Salmonella* from the *coli-aerogenes* groups of bacteria, and a survey of the application of biochemical tests to the subclassification of members of the salmonella group.

III. A review dealing with the classification of the genus *Salmonella*. The Kauffmann-White Scheme for the serological classification of this group is set out briefly, followed by a discussion of the biochemical methods available for subclassifying certain closely related varieties of the genus which cannot be separated by serological methods.—E. J. PULLINGER.

KLEMOLA, V. M., & KNUUTTILA, S. (1936). Ueber das Vorkommen, das biologische und wirtschaftliche Verhalten der *Bacillus Bang*-Infektion (ansteckendes Verwerfen) in Finnland. **[Bovine Brucellosis in Finland]**. —*Maataloust. Aikakausk.* **8.** 36-59. 12 figs., 2 tables. [Numerous refs.] [In German: Finnish summary].

The earliest orders relating to the control of contagious abortion in Finland came into operation in 1910 and were followed by others in 1922 and 1928 respectively, the last of which made notification compulsory. Diagnosis is carried out by the State Veterinary Laboratory and control measures by the district veterinary organization. According to official figures something over 3,000 herds are infected (about 1% of all herds), but it is believed that the incidence of infected herds is considerably greater, as new infections are often not reported for some time. A map showing the relative distribution of the disease is given. Although the figures are a little difficult to follow, it would appear that in infected herds examined by the authors the percentage incidence of infection averaged about 21.

A detailed study was made on nine large herds which had been infected for many years. Abortions were more frequent in heifers and young cows than in older cows, and were relatively more frequent in the summer months, *i.e.*, " in cows served in early spring " ; the average age of aborted foetuses was 6 months 3 weeks, and was not associated with the age of the dam. Second abortions in individuals occurred usually in the first or second pregnancy after the first abortion and took place, on the average, over three weeks earlier. The number of services

required by subsequently aborting cows was greater than in others and 41·2% of cows became sterile. Arthritis was found in 5% of all cows which aborted. Mastitis was not more frequent than in other cows. The average drop in milk production is given as 17·8% for the year of abortion and 10·4% from the succeeding year, except in cases where a second abortion occurred, when it is given as 29·2%.

The total animal loss from abortion in Finland as a whole is assessed at 15-16 million Finnish marks (about £77,600) made up of loss of milk (10 million F. Mk.), loss of calves—slaughter value only—(1·2 million F. Mk.) and cost of private or official control measures (about 5 million F. Mk.)—A. W. STABLEFORTH.

WAGENER, K. (1937). Die Büffel im Yellowstone Park und die Abortusinfektion. —[**Bison in the Yellowstone Park and Brucellosis in these Animals**].—*Tierärztl. Rdsch.* **43.** 499-502 and 515-518. 3 figs. [13 refs.]

For some time now there has been considerable discussion in German veterinary literature between W., who holds strongly the view that nutritional or other influences are of major importance in regard to contagious abortion and who stated in his original article that " one had perhaps to reckon with a certain ubiquity of the causal organism ", and those (HAUPT and others) who insist that it is of first importance to regard *Brucella abortus* as an obligatory parasite and the disease as a purely contagious one [see *V. B.* **8.** 136].

Recently HAUPT cited, in support of this view, the fact that contagious abortion was common in the Yellowstone Park herd of bison which live under natural conditions. W. now challenges this statement. He reviews briefly the whole history of the buffalo (or bison) in North America and points out that the remaining herds are protected in a confined area, have much increased in number since this area was set aside for them, and are fed during the winter months and in many other ways subjected to the same conditions as ordinary cattle.

He notes that one effect of this artificial life has been to lengthen the oestral season which, in the bison in the wild state, extends only from June to September. Reference is also made to the fact that the bison does not usually breed until 3-4 years old and often has only one calf (which sucks for nine months or longer) every two or three years.—A. W. STABLEFORTH.

I. HERMANN, G. (1937). Ueber Herstellung und Erfahrungen mit einer hämatoxylingefärbten Abortus-Bang-Testflüssigkeit zur Frischmilchagglutination. [**Tests of a Haematoxylin-Stained Test Fluid for Bovine Brucellosis Milk Agglutination**].—*Berl. tierärztl. Wschr.* Nov. 19th. 715-717. [12 refs.]

II. SIRK, F. (1937). Die Verwendbarkeit getrockneter Blut- und Milchpräparate in der Bangdiagnostik. [**The Use of Dried Blood and Milk for the Diagnosis of Brucellosis**].—*Wien. tierärztl. Mschr.* **24.** 614-622. [7 refs.]

III. KLIMMER, M., & VOGEL, H. (1937). Die Vollblut- und Schnell-agglutination bei Abortus Bang. [**The Whole Blood and Rapid Agglutination Test for** *Br. abortus*].—*Tierärztl. Mitt.* **18.** 4-6 and 23-25. [Numerous refs.]

I. When using whole milk for agglutination tests the reading of results may be confused by the occurrence of non-specific flocculation of the milk proteins. To exclude this trouble, stained brucella antigen may be used so that the specific brucella clumps may be differentiated from the non-specific milk protein clumps. The details of staining the antigen are given. Delafield's haematoxylin is used, and the important point is to be sure that there is no free stain in the fluid in which the antigen is suspended, and that the strain is well fixed in the bacterial bodies. A method for carrying out a rapid slide technique is detailed. When the results

obtained by this method were compared with those obtained by the ordinary tube test and by the rapid whey-slide method over a series of 23,900 samples, this test proved to be as accurate as the tube method, and slightly more accurate than the rapid whey-slide method.

II. A drop of blood may be spread out on a slide and dried rapidly. If subsequently redissolved off the glass with saline the resulting solution, if not too old, may be used for an agglutination test with *Br. abortus* antigen. Milk may be similarly treated. Such dried preparations will keep for about three weeks. Using this dried serum and comparing the results obtained with those obtained by the ordinary tube method of testing for contagious abortion, there was close agreement, the only difficulties noted in connexion with the use of dried sera being in the case of doubtful reactors.

III. The report of a new serological test for the diagnosis of bovine contagious abortion which has given satisfactory results. Antigen containing saponin is used, as it is claimed that the saponin serves to decrease the occurrence of non-specific protein flocculation which may complicate the reading of ordinary aggl. tests. —E. J. PULLINGER.

I. KREGZDE, J. (1937). Untersuchungen über den Einfluss verschiedener Arten der Vorbereitung der Milch auf den Ausfall der Agglutinationsprobe auf Bang. [**Influence on the Agglutination Reaction of the Method of Dealing with Milk Sample Used**].—*Wien. tierärztl. Mschr.* **24.** 530-531.

II. SCHÖNBERG, F., & IMIG, H. (1937). Ueber eine neue Abortus-Bang-Testpaste und ihre Anwendung für die Milch-Schnelluntersuchung auf Abortus-Bang-Agglutinine. [**A New Method of Rapid Agglutination for *Brucella abortus* in Milk**].—*Dtsch. tierärztl. Wschr.* **45.** 449-450. 1 fig. [5 refs.]

I. In view of the different milk (or whey) titres regarded as indicative of brucella infection of milk, K. has made comparative tests by various methods, all aggl. tests being done similarly by the tube method. 180 milk samples from 76 quarters of 19 cows were examined. The mean agglutinin titre (MT) was calculated according to Diernhofer's formula [*V. B.* **7.** 267].

With milk samples which had a low antibody titre (MT 2-37) little difference was found; with those of moderate titre (MT 37-200) differences were distinct, whilst at high titres (MT 800-1,520) the mean titres for whey treated with chloroform, untreated whey, fresh milk, skim milk and skim milk treated with chloroform were as 100 : 88 : 72 : 67 : 64. Chloroform-treated whey had also the advantage of being clear. The differences reported did not shed much light on the diversity in the milk or whey titre reported as indicative of brucella infection by various workers.

II. The method described is based on the well known slide method of testing with a stained suspension of *Br.a.* The essential part of the authors' modification consists in the use of antigen made in the form of a soft paste in glycerin. It is kept in small bottles closed by a rubber stopper which holds a metal " needle ". This serves to withdraw sufficient of the antigen for one test and to mix it with a drop of whey which has already been placed in readiness on a slide.

A number of strains are grown on agar slopes for 2-5 days and the organisms suspended in " carbol-saline ". They are then stained with carbol-fuchsin or, better, alcoholic dahlia solution, and formalin is added. After two hours, the organisms, if well stained, are centrifuged out, washed with distilled water, re-centrifuged and mixed with an equal weight of 50% glycerin.—A. W. STABLEFORTH.

SANDHOLM, A. (1936). Kan råtta sprida kastnigssmitta? [**Rats as Possible Carriers of Brucella**].—*Suom. Eläinlääkäril.* **42.** 169-177. 5 tables. [8 refs.]

S. states that rats can become carriers of brucella for some time after peroral infection with culture. Virulent bacteria can be found in the faeces for only a few days (7 to 9) after the inoculation. The infection of cattle through rats is possible, but probably rather rare in practice.—P. I. STENIUS (HELSINGFORS).

HUPBAUER, A., & KORDAS, S. (1937). Vakcina protív šuštavca za jednokratno cijepljenje. [**Vaccine for Single Inoculation against Blackleg**].—*Jugoslov. vet. Glasn.* **17.** 89-92. 1 table. [German summary].

The old muscle powder vaccine against blackleg is no longer used in Yugoslavia. In 1930 the use of a bacteria-free filtrate vaccine was introduced, two inoculations being recommended. In 1934, the authors prepared another vaccine by which a much longer immunity was obtained. But as two doses of this vaccine were required, they attempted to prepare a vaccine that would immunize in a single dose. Such a vaccine was prepared, but no tests on cattle have yet been made.—B. OSWALD (KRIŽEVCI).

WEINBERG, M., & GUILLAUMIE, M. (1937). Holosérum anti-perfringens. [**Anti-*perfringens* Holoserum**].—*Rev. Immunol.* **3.** 485-504. 4 tables. [4 refs.]

It is shown that by injecting a horse with a mixture of *Clostridium welchii*, types A, B and D antigens, or with those of types A, C and D, a good holoserum can be prepared. In the course of the authors' investigations it was evident that the response of different horses to the same antigen differed and also that the same horse varied in its receptivity to the different antigens of *Cl. welchii*.

The results of a comparative study of the neutralizing powers of holoserum and of monovalent sera prepared against each of the types are also given. The success of the holoserum production is attributed to the fact that antigens used for immunization were enclosed in lanoline.—GWILYM O. DAVIES.

RUSSELL, A. W. (1937). **Pigeons as Possible Tetanus Carriers.**—*Brit. med. J.* Dec. 18th. 1220. [3 refs.]

This records a fatal case of tetanus in a child, who was apparently associated with a pigeon which was excreting the bacilli in its droppings. The bird itself showed no symptoms and it is suggested that the bird became infected probably by pecking horse manure.—N. J. SCORGIE.

BEREGGI, G. (1937). Ricerche sull'eziologia di un caso di orchite. [**A Case of Actinomycotic Orchitis in a Bull**].—*Clin. vet., Milano.* **60.** 477-483. 3 figs., 1 table. [9 refs.]

The testicles of the bull were sent for pathological examination; the right testicle was slightly atrophied, but otherwise appeared to be normal. The left testicle was enlarged to the size of a child's head and weighed 1,000 g. B. describes his examination, which revealed the cause to be actinomycosis.—S. F. J. H.

HAUPT, H. (1937). Zur Benennung von Bakterien. [**Nomenclature of Bacteria**].—*Arch. wiss. prakt. Tierheilk.* **71.** 489-499. [2 refs.] [See also *V. B.* **8.** 78].

The tribe Pasteurelleae is subdivided by H. into the following genera:—(1) *Haemophilus*, including those organisms which require accessory growth factors. Several of the species included in the genus have not yet received general recognition. (2) *Actinobacillus*, in which, contrary to general usage, H. has included

Pfeifferella mallei and *Pf. whitmori*. (3) *Pasteurella*, comprising *Past. gallicida*, a species including all strains causing haemorrhagic septicaemia in various animal species (*i.e.*, *Past. septica*), *Past. pestis* and *Past. tularensis*. *Past. pseudotuberculosis* is not mentioned. The merits of the whole classification are discussed briefly. —E. J. Pullinger.

DISEASES CAUSED BY PROTOZOAN PARASITES.

Djatkova, I. (1937). Jedan slučaj trypanosomoze goveda u Jugoslaviji. [**A Case of Trypanosomiasis in a Cow in Yugoslavia**].—*Jugoslov. vet. Glasn.* **17.** 57-60. 2 figs. [6 refs.]

In July, 1936, D. was called in to a five-year-old cow, at Skoplje (southern Yugoslavia). As piroplasmosis was suspected, a dose of 12 c.c. of acaprin was administered immediately. However, in blood smears examined later, trypanosomes were detected, but no piroplasms. Four mice, one rat, one rabbit, two dogs and four g. pigs were inoculated with blood from this animal. All the inoculated animals remained healthy, and D. suggests that the organism found was probably *Tryp. theileri*. The cow recovered quickly.—B. Oswald (Križevci).

I. Mazza, S. (1936). Infestación de *Triatoma* por *Schizotrypanum cruzi* y hallazgo de animales domesticos portadores del mismo en el sur de la República (Río Negro y provincia de Buenos Aires). Nueva especie de *Triatoma* determinada en Río Negro. [**Domestic Animals as Carriers of *Trypanosoma cruzi* in Argentine**].—*Misión Estud. Pat. reg. argent.* Publ. No. 26. pp. 1-19. 12 figs. [12 refs.]

II. Mazza, S., Benitez, C., & Janzi, E. Z. (1936). Primer caso de forma aguda de enfermedad de Chagas y primeros animales domésticos portadores de *S. Cruzi* comprobados en corrientes. [**Domestic Animals as Carriers of Chagas' Disease**].—*Ibid.* pp. 28-33. 4 figs.

III. Mazza, S., & Lobos, M. M. (1937). Casos de enfermedad de Chagas y animales domesticos infectados naturalmente con *S. cruzi* comprobados en el Departamento de Trancas, provincia de Tucumán. [**Chagas' Disease in Domestic Animals**].—*Ibid.* Publ. No. 32. pp. 18-30. 10 figs., 1 table.

I & II. A description of instances in which cats and dogs acted as carriers of *Tryp. cruzi*.

III. A three-month-old dog living in the same house as three human cases was found to be heavily infested with *Tryp. cruzi*.—S. Torres.

Schern, K. (1937). Die glykoprivie zur Heilung und Vorbeugung der experimentellen Trypanosomen und Treponemeninfektion. [**Glycoprivia as a Preventative and Cure of Trypanosomiasis and Treponemiasis**].—*Berl. tierärztl. Wschr.* June 11th. 361-363. [Numerous refs.]

S. suggests that the pathological action of infections with trypanosomes and treponema depends on their disturbance of carbohydrate metabolism, the manifestations of which can be detected histologically by the absence of glycogen in the livers of affected animals; the fuel of the liver fails and it is unable to fulfil its functions. Also in the absence of sugars, protein decomposition products cannot be excreted and lead to intoxication.

This intoxication due to glucose deficiency is evidenced by paralysis, delirium and its effect on the nervous system. Finally liver coma and death from the accumulation of uric acid supervene. When glucose deficiency occurs, however,

the carbohydrate metabolism of the parasites is also disturbed. The motility of trypanosomes can be restored by supplying liver extract or serum from normal animals. The line of treatment adopted was intended to remove the sugar supply or to convert it into some form which the parasites could not utilize.

Insulin, phosphorus, urethane and synthalin were tried without success, as they were too toxic for the host. A preparation of decamethylindiguanidin, known as " anticoman ", proved successful, and a dose of one third of a tablet [amount not stated] given orally to a 1,600 g. rabbit and repeated at intervals according to the condition of the animal effected a cure in trypanosome infections. S. considers that the drug not only reduces the glucose supply of the blood, but also destroys the amylase ferment of the parasites. He was able to demonstrate a similar anti-ferment activity in germanin, but not in neosalvarsan or in organic antimony compounds.—U. F. Richardson.

Petersen. (1937). Trichomonadenerkrankungen bei Stuten. [**Trichomonad Genital Infections in a Mare**].—*Dtsch. tierärztl. Wschr.* **45.** 151-152.

P. cultivated trichomonads from the genital tract of 13 mares affected with pyometra. It appeared that a stallion was also affected and had transmitted the infection to other mares. Treatment on the lines adopted for the cattle infection was carried out.—F. Freudenberg (Hamburg).

DISEASES CAUSED BY VIRUSES.

I. Verge, J. (1937). Les ultra-virus. [**Ultra-Viruses**].—*Rec. Méd. vét.* **113.** 653-679. 2 tables.

II. Wollman, E. (1937). Quelques acquisitions récentes dans le domaine des " virus invisibles ". Les virus-protéines. [**Recent Advances in the Study of Viruses. Virus Proteins**].—*Bull. Inst. Pasteur.* **35.** 993-1002. [Numerous refs.]

I. The nature and properties of ultra-viruses are reviewed from every aspect. Filtration and ultrafiltration are described and a table of the relative sizes of the various virus particles is given. The action of physical and chemical agents is discussed ; *in vitro* culture technique is described and a comprehensive table of the culture media for each virus is given. Attention is drawn to the plurality of certain viruses, such as that of foot and mouth disease.

Viruses are classified as (a) those naturally pathogenic, and (b) viruses which cause cell inclusions in many animals. The pathogenic viruses are subdivided into those which are visible, such as that of contagious bovine pleuro-pneumonia, and the ultravisible cytotropic viruses. The latter are further subdivided into neurotropic, dermotropic, endotropic, mesotropic, and bacteriotropic. In conclusion, the nature of viruses is discussed in relation to the recent discovery of the crystalline properties of tobacco mosaic virus.

II. A detailed description is given of the technique for the crystallization of the tobacco mosaic virus. The physical and chemical properties of the virus are described ; the virulence of the virus is found to be undiminished after five successive recrystallizations. Precipitins may be demonstrated in the serum of animals after repeated inoculations of the active crystalline protein.

The technique of the preparation of the virus protein of infectious papilloma of rabbits is described, and its physical properties are briefly discussed.

A protein which possesses all the properties of the original bacteriophage has been obtained from the staphylococcus bacteriophage by treatment with lead sub-

acetate and tryptic digestion, the digest being fractionally precipitated with ammonium sulphate.

Attention is drawn to the great similarity between the three types of virus under discussion, and it is suggested that they should be considered as " chemical viruses ".—E. C. HULSE.

TARANTINO, C. B. (1937). Lotta contro la peste bovina. [**Control of Rinderpest in Italian East Africa**].—*Azione vet.* **6.** 77-78.

The only possibility of controlling rinderpest in Italian East Africa is to organize an extensive veterinary service with strict inspection of all cattle. Should an outbreak occur, a standstill order must be enforced and vaccination of all in-contact animals carried out. The major difficulties of such a scheme are the expense and the control of wandering tribes.—J. A. NICHOLSON.

CACCAVELLA. (1936). Observations sur la transmission de la peste bovine chez les antilopes pongo (Tragelaphus scriptus) et isha (Sylvicapra grimmi). Sérothérapie et virus de passage sur les bovidés. [**Transmission of Rinderpest by Antelopes. Serotherapy and Passage of Virus in Cattle**].—*Ann. Soc. belge Méd. trop.* **16.** 309-312. 5 tables. [1 ref.]

In one pongo and one isha infected with rinderpest, non-febrile reactions were followed by death within 7 days, the incubation period being shorter than in cattle. Hyperimmune bovine serum (30 c.c.) did not protect them against rinderpest. The virus may be attenuated for cattle by passage through antelopes, although it still retains its virulence to a certain extent. Infection was transmitted from one antelope to another without immediate contact.—E. C. HULSE.

I. COLBACK, H. R. F., & CACCAVELLA. (1936). **Note on the Duration of Infectivity in Cattle Inoculated against Rinderpest by the Serum-Simultaneous Method.**—*Conf. vet. Res. Brit. E. Afr. 1936.* pp. 104-106. 2 tables.

II. COLBACK, H. R. F., & CACCAVELLA. (1936). **Observations on the Comparative Potency of Sera Derived from the 1st, 2nd, 3rd and 4th Bleedings.**—*Ibid.* pp. 106-108. 1 table. [Also appeared in *Ann. Soc. belge Méd. trop.* **16.** 313-315].

III. CACCAVELLA. (1936). **An Attempt to Produce a New Vaccine against Rinderpest by Treating Virus with Lysol.**—*Ibid.* pp. 109-112.

IV. TASSIOUS. (1936). **Urine—An Agent of Propagation of Rinderpest.**—*Ibid.* p. 112.

V. METTAM. (1936). **Wild Game and Rinderpest Experiences in Uganda.**—*Ibid.* pp. 113-114.

I. Cattle inoculated against rinderpest by the serum-virus method were infective during the febrile period, and infectivity might persist up to the sixth day after the febrile reaction had subsided. After the sixth day even large quantities of blood were not infective. Faeces and vaginal and nasal discharges were not infective 26 days after the double inoculation. Tables are given summarizing the results.

II. Recovered or " serum-virus " inoculated cattle were hyperimmunized. Bleeding was carried out after 12 days and then at 4-day intervals. A table of results is included. Conclusions drawn were that serum decanted 24 hours after bleeding is less efficacious than serum decanted after the 48th and 72nd hours. The potency of serum remains unchanged during four successive bleedings.

III. C. described a vaccine he prepared and tested on three animals; 1 c.c. of 10% lysol in water was mixed with 25 c.c. of virulent citrated blood (four parts

of citrate per 1,000), the virus being in contact with disinfectant for 30, 20 and five minutes respectively. The animal injected with the material treated for 30 minutes showed no thermal reaction, while the animal receiving material exposed for five minutes showed a rather severe reaction. All three animals proved to be immune some time later.

IV. An experiment was made to ascertain whether virus was excreted in urine of natives after eating meat from a virus producer, the meat being lightly grilled. Two goats were each inoculated (subcut.) with 100 c.c. of urine. One developed rinderpest, while the other showed a slight febrile reaction, but was normal at the eleventh day.

V. A table is given showing the susceptibility of game to rinderpest. The buffalo, eland, wild pig and giraffe are highly susceptible ; the bush-buck, sitatunga, reedbuck, kob and mpala are of moderate susceptibility ; the elephant, hippopotamus, waterbuck, topi, hartebeest and roan oribi are insusceptible. There was doubt as to the susceptibility of the duiker.—J. C. Wallace.

Topacio, T., Coronel, A. B., & Valenzuela, A. (1937). **Preservation and Purification of Dry Rinderpest Vaccine.**—*Philipp. J. anim. Indust.* **4.** 379-388. 1 table. [5 refs.]

Dried rinderpest vaccine, whether flaked or pulverized, gradually loses its potency at either room temperature or freezing point [data concerning storage insufficient]. The authors considered that this might be due to fat oxidation, by which the fat becomes rancid. They, therefore, extracted the fat from the vaccine by various methods, and tried its efficacy after keeping for varying lengths of time at different temperatures. Results obtained gave reason to hope that this method might prove effective in producing a vaccine that could be preserved for a long time.—R. N. Fiennes.

Pellegrini, D. (1937). Gli estratti d'organi virulenti nella preparazione del siero iperimmune contro la peste bovina. [**Virulent Organ Extracts for Hyperimmunization of Cattle against Rinderpest**].—*Nuova Vet.* **15.** 201-207. 3 tables.

After reviewing the work of previous experimenters, P. describes his own work, conducted on a large scale, in the use of virulent organ extracts for the hyperimmunization of cattle producing serum against rinderpest. The extracts were prepared from the prepectoral, prescapular, precrural and popliteal lymph nodes and from the spleen of calves killed 4-5 days after infection with rinderpest. The tissues were placed in 5% phenol for 10-15 minutes, washed in sterile water, pulped and strained ; the filtrate was then diluted 100% with normal saline.

Cattle were immunized with 150 c.c. of the above tissue suspension plus 500 c.c. of blood from the same animals and hyperimmunized with double doses of the above, eight days later. P. claims that this method produces a serum far more powerful than any obtained by using the blood only, and that at the same time there is a saving of 55-60% in the number of calves required to produce the virus.—S. F. J. Hodgman.

Miegeville, G. (1937). Notes et remarques sur l'épizootie de fièvre aphteuse de 1937. [**Foot and Mouth Disease in Morocco in 1937**].—*Maroc méd.* **17.** 263-265.

Two immunologically distinct types of F. & M. disease virus were responsible for two successive epizootics in Morocco in 1937. During February and March a mild form of the disease was observed and the infected animals quickly recovered.

In May the same animals were infected with a more virulent type of the virus. Cattle, sheep, pigs, goats, camels and antelopes were involved; human beings are reported to have shown oral lesions. Symptoms of high fever and vesication of the tongue were observed in horses; [the possibility of an intercurrent epidemic of vesicular stomatitis must not be excluded].

The second epizootic coincided with the arrival of caravans from the desert, and it is suggested that the infection was transmitted by this means. The disease was characterized by its extreme infectivity and high mortality rate. Goats were particularly susceptible and in these animals the disease was complicated by mastitis which proved fatal in 48 hours. In some cases a septicaemic form resembling anthrax was observed.—E. C. Hulse.

I. Bartels, & Claassen. (1936). Zur Frage der Erkrankung des Wildes an Maul- und Klauenseuche und ihre Bedeutung für die Verschleppung in Klauenviehbestände. Nachtrag. [**Foot and Mouth Disease in Game (Supplement)**].—*Berl. tierärztl. Wschr.* **52.** 455-456. [2 refs.]

II. Raethel. (1937). Zur Maul- und Klauenseuche beim Wilde. [**F. & M. Disease in Game Animals**].—*Ibid.* May 28th. 337.

I. The authors give evidence tending to show that wild deer occasionally contract F. & M. disease, and that they may play a part in the spread of it among farm animals. They also quote an article in Stang and Wirth (1929). [*Tierheilkunde und Tierzucht*. Berlin: Urban & Schwarzenberg] in support. [This is in addition to the earlier article by B. and C. (*V. B.* **6.** 803)].

II. R. points out B. and C. have misunderstood the point made. He doubts if wild deer are concerned in the spread of F. & M. disease in the actual circumstances in which they live in Germany.—G. Williamson.

Schofield, F. W. (1935). **Report of an Outbreak of Malignant Catarrh [in Ontario]**.—*Rep. Ont. Vet. Coll., 1934.* pp. 20-22.

An outbreak of malignant catarrh, of rare occurrence, appeared on a farm where a herd of 28 cattle was being wintered, and caused the death of 11 of the 12 cattle affected, usually within 4-5 days of the onset of symptoms and in two cases within 48 hours. The age of the affected animals varied from six months to six years. Toxaemia, rapid pulse, fever and quickened respiration, foetid and purulent nasal discharge, inflammation of the eye with corneal opacity, frequency and persistence of muscular twitchings and, in six cases, severe diarrhoea with the passage of blood clots were the principal symptoms observed.—E. A. Watson.

I. Rinjard, P. (1937). Le coryza gangréneux des bovidés. Coryza gangraenosa bovum. Etude épidémiologique et expérimentale. [**Bovine Malignant Catarrh**]. pp. 142. 16 figs. [Numerous refs.] Paris: Vigot Frères. [8vo].

II. Anon. (1937). Le coryza gangréneux à la Martinique. [**Bovine Malignant Catarrh in Martinique**].—*Rec. Méd. vét. exot.* **10.** 155.

I. This publication is a comprehensive study of B.M.C. including both a review of the work of other authors and a description of the investigation of a recurrent outbreak in France. During a period of four years the disease occurred on a farm each winter with a loss of 25-35% at each outbreak, until the owner decided to give up cattle. The disease is usually sporadic, but occasionally, as in the present case, assumes a severe enzootic form. Of 79 animals exposed to infection 39 became affected and 38 died. The disease was set up in a few healthy cattle by the inoculation (intraven. or subcut.) of blood from affected animals, but not by inoculation of secretions. Filtrates of such infective blood were not infective

and no micro-organisms could be demonstrated. The incubation period in the experimental animals varied from 11-55 days. The period in which the blood is virulent is ill-defined and this probably accounts for failures in transmitting the disease, which recurred in spite of careful disinfection and the absence of cattle from the stable during the summer months.

There were sheep in the neighbourhood, but they had no actual contact with the affected cattle. A calf placed in contact with the sheep showed symptoms after 59 days. A calf inoculated with blood from this calf developed the disease. This supports the work of Goetze and Liess [*V. B.* **1.** 90]. The behaviour of the virus in sheep requires further investigation. Contact experiments are being continued to ascertain the duration of infectivity in sheep. The method by which the virus passes from sheep to cattle is still not clear. R. suggests that parasites may be carriers and that they may themselves be infected and act as a seat of multiplication of the virus. [There is no mention of the work of Daubney (*V. B.* **7.** 21)].

II. Three sporadic cases of this disease occurred within a period of six months. Details are given of the symptoms and of the lesions found P.M. The disease was of a subacute type. Intradermal reactions to tuberculin were negative.

—S. J. Gilbert.

Král, F., Macek, K., & Sobra, K. (1934). Anaemia infectiosa equorum. **[Equine Infectious Anaemia].**—*Klin. spisy. Šk. zvěrolék. Brno.* **11.** 25-218. 11 text figs., 10 figs. on 9 plates, 4 tables. [Numerous refs.] [English, French and German summaries].

E.I.A. is specific for solipeds, but swine, rabbits, g. pigs, fowls and human beings are slightly susceptible. Other domestic animals are resistant. The virus occurs in blood and tissue protein and is present in both the blood corpuscles and in the serum. It is present in urine only if the latter contains albumin. It is rather resistant to common disinfectants.

Natural infection takes place through injured skin or mucous membrane, but does not spread readily amongst horses in contact. Blood-sucking parasites can transmit the virus, but this method of infection is uncommon.

In experimental conditions the incubation period averages 16 days after the injection of whole blood or serum. The disease is manifested by attacks of fever lasting 3-5 days, which recur at intervals and may continue for years. During the fever the horses become depressed and weak, and often show signs of intercurrent disease.

Haematological diagnostic tests are described. The R.B.C. count and haemoglobin content are commonly reduced to 50% of the normal, and the R.B.C. have an irregular morphology and stain badly. The leucocyte count is unchanged, but the bilirubin content of the blood may be increased. The R.B.C. sedimentation rate is abnormally rapid.

P.M. examination does not reveal any characteristic change apart from general signs of anaemia and debility. The spleen is usually enlarged and shows depigmentation. In many cases there is a round cell infiltration of the reticulo-endothelial system and the marrow of the long bones is often abnormally red.

Diagnosis is very difficult and must depend upon the sum of clinical symptoms, the blood picture and horse inoculation tests. The various haematological tests and the histological examination of liver tissue as advocated by Wall and Lehnert are of no value for differential purposes.

Treatment is unsatisfactory, although some improvement in the general condition is obtainable by the use of tonics and appropriate management.

As an aid for control purposes it is recommended that affected horses should

be branded with a mark " A.I." It is important to ensure that serum-producing horses should be free from E.I.A.—E. Přibyl (Brno).

Manusardi, L. (1937). Della peste equina in Eritrea. [**African Horse-Sickness in Eritrea**].—*Profilassi.* **10.** 19-22. [14 refs.]

Horse-sickness is wide-spread throughout Eritrea, being particularly severe during and immediately after the rainy season. Animals suffering from digestive disturbances appear extremely susceptible. The author claims that intravenous injections of methylene blue have given useful results.—J. A. Nicholson.

Debelić, Š. (1936). O prosudaivanju mesa od virus-svinja rabljenih za dobivanje virusa svinjske kuge. [**The Virus Content of Tissues of Pigs Affected with Swine Fever**].—*Jugoslov. vet. Glasn.* **16.** 367-372. 1 table. [Num. refs.]

The flesh derived from pigs used in the production of S.F. virus often shows degeneration and haemorrhages, and a bad odour and taste. Such meat usually contains pathogenic organisms, *e.g.*, *Salmonella cholerae-suis*, and, owing to its high content of S.F. virus, plays an important role in spreading the disease. Neither the pathogenic organisms nor the S.F. virus are destroyed by procedures such as pickling, chilling or smoking.

D. speaks of the use of the carcasses of animals for human food.—

—B. Oswald (Križevci).

I. Lentz, W. J. (1937). **Distemper Immunization—a Resume.**—*Vet. Ext. Quart. Univ. Pa.* **37.** No. 67. 8-12.

II. Wilkinson, D. E. (1937). **Nine Years' Clinical Experience of the Laidlaw-Dunkin Method of Immunisation against Canine Distemper.**—*Vet. J.* **93.** 256-261.

I. The various methods, and the difficulties, of immunization against canine distemper are discussed. L. mentions that Slanetz [*V. B.* **6.** 132.] has shown that puppies up to the age of one month are resistant to experimental infection with distemper virus and if inoculated at that age develop a permanent immunity. As their immunity might be due to transference of antibodies from the mother *via* the placenta or the colostrum, L. suggests that immunization of pregnant or nursing bitches followed by inoculation of the puppies with virus might be a useful method. The possible explanations of " breakdown " or failures in immunization are discussed.

II. W. has immunized over 900 dogs against distemper in the past nine years and has had only one " breakdown ", which he thinks was due to an idiosyncratic failure of the dog to respond to the vaccine. He considers that most of the " breakdowns " reported have been due to faulty technique, useless vaccines or wrong diagnoses. In differential diagnosis he stresses the importance of ascertaining the period of incubation, which in distemper is invariably four days. The effect of the early administration of hyperimmune serum is also a useful guide, as serum has a curative effect in distemper, but no effect in other conditions.—C. McG.

I. Dalldorf, G., Douglass, Margaret, & Robinson, H. E. (1938). **Canine Distemper in the Rhesus Monkey (Macaca mulatta).**—*J. exp. Med.* **67.** 323-332. 1 text fig., 2 figs. on 1 plate, 6 tables. [4 refs.]

II. Dalldorf, G., Douglass, Margaret, & Robinson, H. E. (1938). **The Sparing Effect of Canine Distemper on Poliomyelitis in Macaca mulatta.**—*Ibid.* 333-343. 1 text fig., 2 tables. [10 refs.]

I. Canine distemper has been transmitted to 63 *rhesus* monkeys. Neither

the source of the virus nor the route of inoculation appeared to influence the course of the disease, which in its main features was strikingly similar to, if not identical with, distemper in dogs. The disease seemed more benign than in other susceptible animals and only four monkeys died, three from encephalitis and one from pneumonia.

Monkeys destroyed during the course of the disease showed intense congestion of the spleen and early degeneration of the cortical epithelium of the suprarenals, followed by intense subcapsular regeneration. All cases in which death occurred before the twentieth day following inoculation showed inclusion bodies in epithelial cells of the kidneys or suprarenal cortex.

II. The authors show that in the course of distemper in the monkey the animal seems to develop a peculiar resistance to experimental poliomyelitis. This is at its maximum during the second week of distemper and disappears during convalescence. This resistance to experimental poliomyelitis does not develop in monkeys in the course of infection with the virus of equine encephalomyelitis or of vaccinia encephalitis. Monkeys vaccinated with distemper vaccine responded in an atypical manner, but distemper antiserum appeared to be without influence on the development of poliomyelitis.—Gwilym O. Davies.

Cruveilhier, L., & Viala, C. (1937). Pouvoir rabicide et immunité antirabique. [**Connexion between the Rabicidal Power of the Serum and Immunity**].—*Ann. Inst. Pasteur.* **59.** 207-215. [9 refs.]

Observations were made on the duration of rabicidal power in the serum of human beings who had undergone a course of antirabic vaccination, and of experimental vaccinated rabbits. The neutralizing power of serum for fixed virus was tested by mixing them *in vitro* and injecting the mixture into g. pigs: controls were used.

It was found that virus antibody appeared in the blood of man and rabbits during the course of vaccination and apparently earlier in rabbits than in man, but it persisted longer in man than in rabbits, so far as could be determined from periodical testing up to seven months after the completion of vaccination. There was great individual variation.

Rabicidal power of serum and immunity against rabies were found to be directly connected, according to the results of appropriate tests made on rabbits.
—F. H. Manley.

I. Tóth, A. (1937). Tanulságok egy juhhimlőjárvány lefolyásából. [**An Outbreak of Sheep Pox**].—*Állatorv. Lapok.* **60.** 151-152.

II. Pecsi, D. (1937). Megjegyzések v. Tóth Antal dr. "Tanulságok egy juhhimlőjárvány lefolyásáról" című cikkéhez. [**Comment on Toth's Paper on Sheep Pox**].—*Ibid.* 223-224.

I. In 1936 an outbreak of sheep pox occurred in Hungary involving 234 farms; 12,572 sheep were affected and 691 of them died. The outbreak was caused by a rough method of immunization applied by shepherds—the so-called ovination method. 5,624 sheep were given sensitized vaccine, without success, but the outbreak was stopped by the careful application of untreated virus.

II. P. states that he has had excellent results with Bridré and Boquet sensitized vaccine method applied to 57,000 sheep in recent years. The failure recorded above was probably due to the fact that the outbreak was extremely severe and took place in a district previously free from sheep pox.—G. Sályi (Budapest).

Vittoz, R. (1936). Recherches sur la diphtérie aviaire en Cochinchine. (Virus gallin et virus colombin). [**Fowl Pox in Cochin China**].—*Arch. Inst. Pasteur Indo-Chine.* **6.** 375-392. [15 refs.]

In the poultry population of about 8½ million, V. considers that 35% of the mortality is due to fowl pox. The disease occurs in three forms, peracute, acute or subacute, and chronic. In those outbreaks where fowl pox is of the diphtheritic type, the majority of cases terminate fatally. Survivors are worthless economically, and perpetuate the disease.

Experimental infection in the fowl and the pigeon showed an incubation period of 36 hours and a duration of 4-5 days. The virus could be recovered from lesions of the oral mucous membrane, pharyngeal muscles, and from the blood, bone-marrow, liver, spleen, kidneys, lungs and brain, following intramuscular inoculation of infective material. Thirty-five passages of fowl virus in the fowl failed to alter its virulence in any way.

Contrary to the findings of Doyle, and Minett [(1927). *J. comp. Path.* **40.** 247.] V. failed to notice any resistance of the pigeon to fowl virus.—D. L. Hughes.

Hudson, J. R. (1937). **Observations on a Highly Fatal Virus Disease of Fowls from East Africa.**—*Vet. J.* **93.** 356-368. 2 charts. [Numerous refs.]

A highly fatal disease of fowls occurred in a flock at Mombasa and an affected fowl was forwarded to the laboratory. A heavy mortality had occurred in that neighbourhood. Later reports received indicate that the disease is enzootic along the coast, with extensive and virulent outbreaks every few years. Twenty-eight birds were experimentally infected and 27 died, death occurring in 3-21 days, with an average of 7·2 days. Controlled experiments showed the disease to be due to a virus. The virus was highly resistant to the action of glycerin, but apparently did not survive long under natural conditions. The disease was transmitted to pigeons by intramuscular injections. The symptoms include diarrhoea, dullness, marked increase of secretions of the head, alternate extension and retraction of the neck, and gasping during inspiration. Tracheal rales may be heard and a sharp cough. Leg weakness develops and the bird dies in a prostrate position. A marked temperature reaction occurs, the temperature becoming subnormal before death. The P.M. appearances vary, but lesions are usually found in the larynx, which may show severe haemorrhages and ulceration with necroses and diphtheritic exudate. Haemorrhages in the proventriculus occurred in 80% of the experimental cases. Among other lesions haemorrhages and ulcers in the small intestine are described. The relationship of this disease to other virus diseases of fowls is discussed and of these it appears chiefly to resemble Newcastle disease.—S. J. G.

I. Furth, J., & Breedis, C. (1935). **Lymphomatosis in Relation to Fowl Paralysis.**—*Arch. Path.* **20.** 379-428. 16 figs., 15 tables. [Numerous refs.]

II. Stubbs, E. L. (1937). **A Study of Fowl Paralysis and its Relation to Leukemia.**—*Vet. Ext. Quart. Univ. Pa.* **37.** No. 67. 3-8. 6 figs.

III. Johnson, E. P. (1937). **Transmission of Fowl Leukosis.**—*Poult. Sci.* **16.** 255-260. 2 figs. [5 refs.]

I. Working with two transmissible strains of neurolymphomatosis, the authors found that the blood contained the transmissible agent during the entire illness. Neurolymphomatosis could be reproduced intravenously and intraneurally. Intraneural inoculation caused great thickening and infiltration of the injected nerve, but the spinal cord seldom became affected. The inoculum was only infective when it contained viable lymphocytes, and the transmissible agent was

inactivated by freezing at –30°C. for 30 minutes, or by drying from the frozen state. Blood cells readily transmitted the disease; plasma did not.

Lymphomatous infiltrations and visceral tumours developed from the inoculation of material from cases of neurolymphomatosis. Generally speaking, cases of neurolymphomatosis were unassociated with changes in the circulating blood, but in rare instances there was lymphoid leucaemia. The authors conclude that neurolymphomatosis is a neoplastic process related to leucosis and sarcoma, but not related to the erythroid and myeloid type of leucosis.

This article should be consulted by all who are interested in lymphomatosis and allied diseases. The photographic plates are excellent.

II. A brief description is given of various transmission experiments. The infective material consisted of " grey eyes " and swollen and enlarged nerves. In no case did lesions of lymphomatosis develop. [The experiments were unsatisfactory in that the typical histological picture of lymphomatosis could not be demonstrated in any of the so-called infective material].

III. J. discusses the definition of the term " fowl leucosis ", taking it to mean the erythroid, lymphoid and myeloid forms, which he claims can be set up by the inoculation of bacteria-free filtrates of blood and other leucotic organs. He describes a number of experiments to test possible means of spread under field conditions. The possibility that infective material might be spread by the common red mite (*Dermanyssus gallinae*) was investigated. The mites were allowed to feed on birds suffering from various forms of the disease and then placed on healthy two-month-old birds. Out of 16 birds so treated, five developed some form of leucosis, three showed the lymphoid form and one the myeloid, and one developed neurolymphomatosis. Experiments were undertaken to see whether the scarification method of vaccination against fowl pox was also capable of spreading the disease. Out of 38 birds vaccinated with the same vaccine as had been used to inoculate an infected bird, the brush used on the latter being returned uncleansed to the vial of vaccine, seven developed the disease; one of the control group also became infected.

These experiments appear to bear out J's contention that one form of the disease may arise from the inoculation of material from a bird suffering from one of the other types of leucosis; they also suggest that the disease may be spread by an insect vector or by artificial scarification or through accidental abrasion.

—D. L. Hughes.

Stubbs, E. L. (1937). **Fowl Leukaemia and its Relation to Tumors.**—*Vet. Ext. Quart. Univ. Pa.* **38.** No. 68. 13-18. 2 tables. [9 refs.]

In view of the claims of various authors to have produced tumours from the inoculation of leucaemic material, S. re-examined his leucaemia strain I for this property. Strain I gives rise to erythroleucosis or myeloid leucosis. Commencing with a case of erythroleucosis, 18 chickens were inoculated (intramusc.) with blood into the left breast, and with ground up liver into the right breast.

In these and subsequent passages neither tumours nor cases of fowl paralysis developed. The type of leucaemia that developed, *i.e.*, erythroleucosis or myeloid leucosis, bore no relation to the inoculum.—D. L. Hughes.

I. Uhl, E., Engelbreth-Holm, J., & Meyer, A. R. (1936). **On the Production of Sarcomata in Pure Chicken Leucosis Strains.**—*Acta path. microbiol. scand.* **13.** 434-452. 3 figs., 9 tables. [16 refs.] [In English].

II. Gibbs, C. S. (1936). **Observations and Experiments with Neurolympho-**

matosis and the Leukotic Diseases.—*Bull. Mass. agric. Exp. Sta.* No. 337. pp. 31. 6 figs., 15 tables. [18 refs.]

III. Lee, C. D., Wilcke, H. L., Murray, C., & Henderson, E. W. (1937). **Fowl Leukosis.**—*J. infect. Dis.* **61.** 1-20. 9 tables. [Numerous refs.] [Also appeared in *J. Amer. vet. med. Ass.* **91.** 146-162].

I. The authors demonstrated that when blood from two different strains of leucosis was inoculated (subcut. or intramusc.) a large number of sarcomata developed. When similar material was injected (intraven.) this did not occur. Sarcomata also developed following the injection of leucotic plasma, but the number of resultant positive cases was smaller. The authors believe that the different strains of leucosis " virus " which cause variable changes in inoculated fowls, are neoplasms of different degrees of maturity, the more mature ones causing more severe lesions.

II. G. discusses erythroleucosis and myeloleucosis and shows that these diseases can be set up by inoculation of cell-free plasma from affected cases, although not so regularly as with whole blood. He also shows that red mites play a part in transmitting myeloleucosis, and that resistance to these diseases increases with age. Lymphomatosis was transmitted by inoculation (intraven. and intraperit.) of portal blood containing numbers of living lymphoblasts. G. reports the successful transmission of neurolymphomatosis by inoculating into the brachial and sciatic nerves lymphoblasts which did not stain after treatment with trypan blue. Evidence is produced that the disease is transmitted through the egg. Seminal fluid and follicular fluid from affected birds were examined, and cells indistinguishable from those present in neurolymphomatosis were demonstrated.

A successful attempt was made to transmit the disease by inoculating developing chick embryos.

III. The types of leucoses are defined, and literature on the subject is reviewed. A description of the clinical manifestations is given, particular attention being paid to neurolymphomatosis. The results of transmission experiments are given. When fowls were inoculated (intraperit.) with erythroleucotic material 70% became affected with erythroleucosis, myeloid leucosis, and haemocytoblastic and lymphocytic infiltrations. When material from enlarged nerves was used as an inoculum the different types of leucosis again resulted. Similar results were obtained using material from ovarian tumours (neurolymphoma). In each experiment the disease occurred in the control group. The authors deduce from these experiments that the several leucaemias and neurolymphomatosis are different expressions of the same disease and are transmitted by a common agent. Evidence is produced to show that the disease may be transmitted through the egg and that it may also be acquired from contaminated litter. Certain strains of fowls were more resistant than others.—J. E. Wilson.

Murphy, J. B. (1936). **Relation of Filtrable Viruses to Malignant Disease.**—*Proc. Mayo Clin.* **11.** 789-790.

Many efforts have been made to identify an infectious agent as the cause of malignant disease. Although, in the fowl and in the rabbit, certain tumours have been found to be transmissible by the inoculation of cell-free filtrates, as tumours artificially induced by chemical carcinogenetic agents can be similarly transmitted, the evidence suggests that the agents concerned are intrinsic cell substances, and not viruses in the generally accepted meaning of the term. It is very difficult to apply a virus theory to cancer; it can only be accepted that a virus may act as a carcinogenetic agent, causing an initial proliferation of the tissues, but not concerned with the development or maintenance of malignancy.—Norman Hole.

Rous, P. (1935). **The Virus Tumours and the Tumor Problem.**—*Harvey Lect.* **31.** 74-115. 46 figs., 2 tables. [Numerous refs.]

" The tumor problem is the last stronghold of metaphysics in medicine." R. deals with the evidence that has accumulated from the attacks made on the problem, in particular with work on fowl tumours and Shope's rabbit papilloma. He points out that artificially induced tumours " offer a controlled material for experimental tests, but a dubious basis for thoughts on causation " and the original cell-type of tumours may be almost lost with passage, which tends to standardize the growth and results in the formation of a new, fixed variety of cell.

The filtrable agents of certain chicken tumours obey the criteria necessary to justify their being termed viruses, and Shope's rabbit papilloma appears to have the attributes of a tumour in addition to a demonstrable infectious cause. In the domesticated rabbit this papilloma definitely tends to develop into a malignant growth, and there is some evidence to suggest that the virus plays a part in the malignancy.

Tumour cells are " sick " cells which may be undergoing chromosome troubles, degenerations, metaplasias, etc. ; viruses may have such effects on cells, and this seems to be the nearest we have come towards determining the cause of tumour formation.—Norman Hole.

I. Hoyle, L., & Fairbrother, R. W. (1937). **Further Studies of Complement-Fixation in Influenza : Antigen Production in Egg-Membrane Culture and and the Occurrence of a Zone Phenomenon.**—*Brit. J. exp. Path.* **18.** 425-429. 3 tables. [6 refs.]

II. Fairbrother, R. W., & Hoyle, L. (1937). **Active Immunization against Experimental Influenza : the Use of Heat-Killed Elementary Body Suspensions.**—*Ibid.* 430-436. 6 tables. [6 refs.]

III. Stuart-Harris, C. H. (1937). **Influenza Virus Infection of Rats and Guinea-Pigs.**—*Ibid.* 485-492. 5 tables. [12 refs.]

IV. Burnet, F. M., & Lush, Dora. (1938). **Influenza Virus on the Developing Egg : VII. The Antibodies of Experimental and Human Sera.**—*Ibid.* **19.** 17-29. 3 figs., 3 tables. [10 refs.]

I. It is shown that a complement-fixing antigen is produced when influenza virus is grown on the chorio-allantoic membrane of the developing chick embryo, and that the antigen can be prepared as a saline extract of either the fresh or dried infected membrane. As many workers agree that the growth of the virus is not accompanied by definite pathological changes in the chorio-allantoic membrane, this may be used as a valuable test, as it displaces animal inoculation as a test for the growth of the virus.

II. By separating crude suspensions of influenza virus into :– (1) elementary bodies, and (2) a soluble substance containing complement-fixing antigen, the authors showed that the immunogenic factor is present in the elementary bodies. Suspensions of elementary bodies were treated in various ways and it was shown that suspensions killed by heating at 57°C. for 30 minutes had an immunizing power equal to that of living or formolized virus. The immunization of ferrets appears to be much more difficult than that of mice.

III. In the course of a search for a small laboratory animal in which the virus would produce a contagious disease—a search which has so far proved fruitless—the author tested the susceptibility of the rat and g. pig. In neither animal did a clinical infection occur, and the infection was without the characteristic lesions which are found in the ferret and the mouse. In the rat the virus appeared to be dying out and was abandoned after 18 passages, but in the g. pig it was increased

in amount after 31 passages. In neither animal was the infection transmissible by contact.

IV. This paper represents the consolidated experience of two years' work on the virus-antibody content of various types of sera. The study was directed primarily to seek an explanation of the discrepancy which exists between the results obtained by the three established methods by means of which antibodies against a given strain of influenza virus are titrated. The results and discussion do not lend themselves to abstraction within a limited space.—GWILYM O. DAVIES.

I. PIGOURY, L. (1937). Existence de *Rickettsia conjunctivae* du mouton au Levant. [*R.c.* **of Sheep in the Levant**].—*Bull. Soc. Path. exot.* **30.** 621-624. [2 refs.]

II. MOCHKOVSKI, C. K. (1937). Sur l'existence, chez le cobaye, d'une rickettsiose chronique déterminée par *Ehrlichia* (*Rickettsia*) *kurlovi* Subg. nov. sp. nov. [**Chronic** *E.k.* **Infection (Kurloff Bodies) of Guinea Pigs**].—*C. R. Soc. Biol. Paris.* **126.** 379-382. 2 figs. [5 refs.]

I. P. records the detection of conjunctivitis in sheep due to *R.c.* in the Levant. In the affected flock 40% of the lambs 3-4 months old were infected, whilst only one adult showed symptoms of disease. In most cases infection was unilateral. The disease was benign, recovery occurring in 10-15 days. In some cases keratitis occurred, and in these recovery was more delayed. It is suggested that the adult sheep form a reservoir of infection.

II. M. claims that whilst the young forms of Kurloff bodies in the monocytes of g. pigs may appear homogenous, the older forms appear as a mass of granules, and even bacillary rods and filaments may be present. The bodies do not appear in g. pigs till three weeks after birth, and it is suggested that they represent a rickettsial infection.

It is proposed to create a new genus *Erhlichia* to include *Rickettsia* which invade monocytes, and to include in this genus *R. bovis*, *R. canis* and Kurloff bodies under the name *Ehrlichia kurlovi*. It is pointed out that the detection of Kurloff bodies in dogs has been recorded, and that they may be identical with *R. canis*. —U. F. RICHARDSON.

AMATO, G. (1937). Azione dell'acido ascorbico sul virus fisso della rabbia e sulla tossina tetanica. [**Action of Ascorbic Acid on Rabies Virus and on Tetanus Toxin**].—*G. Batt. Immun.* **19.** 843-849. [19 refs.] [English, French and German summaries].

A. studied the action of ascorbic acid on the fixed virus of rabies and on tetanus toxin. The results lead him to conclude that ascorbic acid possesses the property of inactivating the fixed virus of rabies *in vitro*, and that under certain experimental conditions it can attenuate and inactivate (also *in vitro*) tetanus toxin. —S. F. J. HODGMAN.

FROHRING, W. O. (1937). **Vitamins and Distemper. VI. Canine Blacktongue. VII. Summary of Various Vitamins Known at present with Recent Developments with Particular Reference to Dogs.**—*Vet. Med.* **32.** 414-417 and 468-474. 5 figs. [Numerous refs.] [See also *V. B.* **8.** 58].

VI. A short review of the literature dealing with canine blacktongue is given. F. produced the early symptoms of blacktongue in two puppies by feeding them on a modified Goldberger diet. Two other puppies given a synthetic diet supplemented with vitamins B_1 and B_6 and lactoflavin died on the 25th and 43rd days respectively without deficiency symptoms appearing at any time during the experi-

ment. The rapidity with which diarrhoea develops in dogs when they are deprived of the vitamin B_2 complex suggests the possibility that chronic gastro-enteritis may be due to a prolonged mild deficiency of the blacktongue-preventing factor.

VII. This is a useful résumé of the available information dealing with vitamins, particularly with reference to deficiency in the dog. Apart from the already well known deficiency manifestations, the following are dealt with :– essential fatty acids, nutritional encephalomalacia (chicks), myopathy (ducklings), muscle dystrophy (rabbits and pigs), Castle's " extrinsic factor " and the cataract-preventing factor.—N. J. Scorgie.

Nicolau, S., & Baffet, O. (1937). Fièvre jaune inapparente révéléé par la présence de lésions et d'inclusions dans le système nerveux des chiens inoculés avec le virus amaril. Insensibilité du chat à l'égard de l'action pathogène de ce même virus. [**Inapparent Yellow Fever Diagnosed in Dogs, by the Presence of Inclusions in the Nervous System : Insusceptibility of Cats**].—*Bull. Soc. Path. exot.* **30.** 611-615. 2 figs. [9 refs.]

Kittens were totally refractory to inoculations into the brain, but puppies were shown to have been infected by the presence of typical lesions and inclusions in the nuclei of the neurones. The virus could not be passaged to mice and probably was killed by " auto-sterilization ". No clinical symptoms appeared in any of the animals, including an inoculated puppy retained under observation for several months.—S. J. Gilbert.

PARASITES IN RELATION TO DISEASE [ARTHROPODS].

Dunn, L. H. (1934). **Entomological Investigations in the Chiriqui Region of Panama.**—*Psyche, Camb., Mass.* **41.** 166-183. [2 refs.]

The investigations were made during three short visits to the area and a very large number of species were collected from various places and hosts. The majority of hosts were wild birds and animals. Of 16 species of insects obtained from domesticated animals 13 were collected from a mule, and of these six were species of *Tabanus*. Larvae of *Gastrophilus nasalis* were found in the stomach of a horse at P.M. examination.—W. J. Ironside.

PARASITES IN RELATION TO DISEASE [HELMINTHS].

Taylor, E. L. (1937). **The Diagnosis of Helminthiasis in Farm Animals.**—*Vet. Rec.* **49.** 1259-1262.

In this paper T. stresses the difficulties of diagnosing diseases due to helminths and points out that the mere determination of the presence of helminths does not prove that they were the cause of illness.

In the determination of the presence of helminths the value of examination of the faeces for eggs is shown to be limited. The number of eggs present is greatly influenced by the nature of the intestinal contents and by the rate at which they pass along the alimentary tract. In affected adult sheep the number of eggs found may be identical with that in normal animals, while the number of parasites actually present is exceedingly high. Further, the examination completely fails to show the presence of immature forms. Careful consideration of the history of an outbreak can be of great value and P.M. examination of one or two affected animals provides the most reliable evidence.—W. J. Ironside.

GRIFFITHS, H. J. (1937). **Some Observations on the Overwintering of Certain Helminth Parasites of Sheep in Canada.**—*Canad. J. Res.* Sect. D. **15.** 156-162. 1 fig., 1 table.

During the four winter months of December, 1935, to March, 1936, a range in temperature of 52·5°F. to −15°F. was encountered near Montreal. *Moniezia expansa*, *Ostertagia circumcincta*, *Nematodirus filicollis* and *Trichostrongylus colubriformis*, survived this winter on permanent pastures, as shown by actual infection experiments on parasite-free lambs.—T. W. M. CAMERON.

MIKAČIĆ, D. (1937). Entoparazitička fauna zaklanih i uginulih svinja. **[Internal Parasites of Swine].**—*Vet. Arhiv.* **7.** 401-413. 1 chart. [10 refs.] [German summary].

One hundred pigs from the north-western regions of Yugoslavia were examined for internal parasites, and the following species were determined :– *Fasciola hepatica* once in the bile-ducts, *Taenia solium* larvae once in the muscles, *T. hydatigena* larvae seven times on the peritoneum, *Echinococcus granulosus* cysts 17 times altogether in the lungs, liver and spleen, *Ascaris lumbricoides* 39 times in the small intestine, *Strongyloides ransomi* once in the stomach and small intestine, *Oesophagostomum dentatum* 68 times in the large intestine, *O. longicaudum* 27 times in the large intestine, *Hyostrongylus rubidus* three times in the stomach, *Metastrongylus elongatus* 51 times in the bronchi, *Choerostrongylus pudentodectus* 33 times in the bronchi, *Arduenna strongylina* three times in the stomach, *Physocephalus sexalatus* once in the stomach, *Gnathostoma hispidum* once in the stomach, *Trichuris trichiura* four times in the large intestine, and *Macracanthorhynchus hirudinaceus* six times in the small intestine. Some of the above species were recorded in Yugoslavia for the first time.—B. OSWALD (KRIŽEVCI).

TAYLOR, E. L. (1937). **The Economic and Disease Aspects of Parasitic Worm-Infestation in Poultry.**—*Emp. J. exp. Agric.* **5.** 43-47.

T. divides parasitic worms of poultry into two groups :– definite pathogens and indefinite pathogens. The first group are represented in this country by the gapeworm of chickens (*Syngamus trachea*), and the gizzard worm of geese (*Amidostomum anseris*). Although both these diseases are fatal and frequently occur as acute outbreaks, they appear to cause comparatively little trouble at the present time.

In the second group the most commonly occurring species are the caecum worm (*Heterakis gallinae*), the roundworm (*Ascaridia lineata*), the thread worm (*Capillaria longicollis*) and the small tapeworm (*Davainea proglottina*). These species are widely distributed in this country and often occur in healthy birds. Their exact pathological significance is obscure, but what little work has been done suggests that, although severe infestations may cause disease, light or moderate infestations are of little importance, and the wholesale treatment of flocks is not justifiable unless a heavy infestation has been shown to be present.—R. F. GORDON.

WARDLE, R. A. (1937). **The Physiology of the Sheep Tapeworm, *Moniezia expansa* Blanchard.**—*Canad. J. Res.* Sect. D. **15.** 117-126. 2 tables. [18 refs.]

W. believes that the saline media usually employed in physiological studies are useless for the study of tapeworm physiology and that the use of a semi-gel may be necessary, in which the worm may be embedded after preliminary aseptic treatment. Glucose seems to be the one carbohydrate requirement of these animals.—T. W. M. CAMERON.

FAURE, L. (1936). Un cas de ladrerie caprine. [**Cysticercosis in a Goat**].—*Ann. Parasit. hum. comp.* **14.** 485-488. 3 figs.

Cysticercosis [parasite unnamed] in an adult South Tunisian goat is described as a rarity. Numerous cysts, mostly in a degenerated state, were found in the myo- and endocardium, two in the anconeus muscle and one each in the tongue, diaphragm, superficial pectoral and masseter muscles. The parasite was not identified, but its morphology is described and illustrated.—G. WILLIAMSON.

WARDLE, R. A., & MCCOLL, Ellen L. (1937). **The Taxonomy of *Diphyllobothrium latum* (Linné, 1785) in Western Canada.**—*Canad. J. Res.* Sect. D. **15.** 163-175. 3 figs., 3 tables. [32 refs.]

The authors believe that all records of *Diphyllobothrium* from man and dog in Manitoba should probably be referred to *D. latum*.—T. W. M. CAMERON.

SALHOFF, S. (1937). Fakultativer Parasitismus von Anguilluliden bei einer Hauterkrankung des Pferdes. [**Worms of the Family Anguillulidae as Facultative Parasites in Skin Lesions in Horses**].—*Berl. tierärztl. Wschr.* August 13th. 505-506.

In microscopic examination of material from a case of moist eczema of the hind limbs of a horse, S. observed the presence of anguillulid worms. He makes no suggestion that they were pathogenic.—F. FREUDENBERG (HAMBURG).

EHRLICH, I. (1937). Kutikula kao mehanički uvjetovana diferencijacija epidermalnog sincicija kod nematoda *Toxocara cati* (Schrank, 1788). [**The Cuticle of *T.c.* (Schrank, 1788)**].—*Vet. Arhiv.* **7.** 438-457. 3 tables. [Numerous refs.] [German summary].

The functions and morphology of the cuticle of *T.c.* were studied.

—B. OSWALD (KRIŽEVCI).

PARNELL, I. W. (1937). **Studies on the Bionomics and Control of the Bursate Nematodes of Horses and Sheep. IV. On the Lethal Effects of Some Nitrogenous Fertilizers on the Free-living Stages of Sclerostomes.**—*Canad. J. Res.* Sect. D. **15.** 127-145. 11 figs., 1 table. [Numerous refs.] [See also *V. B.* **7.** 539].

Continuing his work on the effects of chemicals on sclerostome larvae in manure, P. finds that urea is the most lethal of the commoner nitrogenous fertilizers, ten of which he has tested. One part of urea to 125 parts of fresh horse faeces kills all larvae present. One part of calurea (a nitrogenous fertilizer) to 80 of faeces, or one of cyanamide to 50 of faeces is equally effective.—T. W. M. CAMERON.

PAVLOV, P. (1937). Recherches expérimentales sur le cycle évolutif de *Syntheto-caulus capillaris*. [**Life-Cycle of *S.c.***].—*Ann. Parasit. hum. comp.* **15.** 500-503. 3 figs. on 1 plate.

The most important intermediate host of *S.c.* was found to be the mollusc *Helicella obvia* (Ziegler) of which 15-20% were infected. The infected snails usually contained 4-5 larvae each, and the development of the larvae in the musculature of the snail is described. Prophylaxis consists of turning pigs on to the ground during the snail season when the snails are eaten as a mineral supplement by the pigs.—P. S. WATTS.

ANDREWS, Mary N. (1937). **Hyper-Infection of Dogs with the Microfilariae of *Dirofilaria immitis*.**—*J. Helminth.* **15.** 167-168. 1 fig. [2 refs.]

A. reports finding in dogs near Shanghai a hyperinfection with *D.i.* In one case the count showed 405 microfilariae to 1,000 white blood cells.

Wuchereria bancrofti is also present in the district, the carrier being *Anopheles hyrcanus* var. *sinensis*, which is also suitable for the development of *D.i.*—E. E. J.

GALLIARD, H. (1937). *Onchocerca cebei*, espèce nouvelle, parasite des buffles du Tonkin. [*O.c.* **in Buffaloes in Tonkin**].—*Ann. Parasit. hum. comp.* **15.** 431-433. 1 fig. [3 refs.]

G. describes a new species of *Onchocerca* causing subcutaneous swellings of buffaloes, and gives the morphological characters which differentiate it from 11 other known species. The great variation in the size of the large (330-365μ) and small (80-112μ) male spicules alone serves to differentiate this species from all the others except *O. cervicalis*.—C. V. WATKINS.

JOHNSTON, T. H. (1936). **A Note on the Occurrence of the Nematode Gongylonema pulchrum in Man in New Zealand.**—*N.Z. med. J.* **35.** 172-176. [15 refs.]

A worm was excised from the upper lip of a Jugoslav in Auckland and identified as a female *G.p.* containing ripe eggs. No microfilariae were discovered in the blood. The patient had visited Jugoslavia *via* Suez two years previously. A history of previous cases mentioned in literature is given.

As far as is known, gongylonema does not occur in New Zealand livestock. —C. S. M. HOPKIRK.

I. MATOFF, K. (1937). Der Mechanismus der Altersimmunität des Hundes gegen die Trichinelleninfektion. [**Age-Immunity of Dogs Against Trichinella**].—*Tierärztl. Rdsch.* **43.** 354-359 and 369-373. 1 table. [Num. refs.]

II. MATOFF, K., & WAPZAROWA, M. (1937). Wieviel Jungtrichinellen kann eine weibliche Darmtrichinelle gebaren ? [**Number of Larvae Produced by an Intestinal Trichinella Worm**].—*Z. InfektKr. Haustiere.* **51.** 89-98. 3 tables. [8 refs.]

I. M. fed 29 dogs varying in age from six weeks to three years, with large numbers of muscle trichinae. He also fed ten adult worms to a five-month-old dog. All the dogs were killed two days to two months after infestation and examinations were made of their intestinal mucous membrane and faeces, and of various muscles. The result showed that resistance to trichinella increases with age. Worms generally became established in young dogs, but only with difficulty in the old ones.

II. One male and one female adult trichinella were given *per os* to each of 23 mice which were killed after 5-7 weeks and searched for larvae in the muscles. Fifteen mice were free from the parasites, but the remaining eight each contained on an average 315 larvae. In another experiment the ratio of male to female worms in the host was found to be 1 : 2·5.—F. FREUDENBERG (HAMBURG).

I. PAVLOV, P. (1937). Recherches expérimentales sur la trichinose des volailles. [**Experimental Trichinosis in Birds**].—*Ann. Parasit. hum. comp.* **15.** 434-439. [7 refs.]

II. PAVLOV, P. (1937). Recherches expérimentales sur la trichinose des volailles et des vertébrés à sang froid. [**Experimental Trichinosis in Poultry and Cold-Blooded Vertebrates**].—*Ibid.* 440-447. [15 refs.]

III. PAVLOV, P. (1937). Recherches expérimentales sur l'immunité dans la trichinose. [**Immunity in Trichinosis**].—*Ibid.* 448-452. 1 table. [16 refs.]

I. As a result of numerous experiments with pigeons, magpies and crows, P. concludes that birds are only relatively immune to muscular and intestinal

trichinosis, the growth rate of the parasites compared to that in rats, mice, rabbits and g. pigs being less, the parasites themselves being straight, unencapsulated and more slender. When present the larvae were usually found in the muscles of the head and neck of birds.

II. After further experimental infection of pigeons, P. concludes that their immunity against muscular trichinosis is almost complete. Larvae found in their muscles were usually dead.

Various fish and frogs possessed a complete natural immunity against *Trichinella spiralis* under the variable conditions in which P. attempted to infect them. White rats, pigeons and frogs were given intramuscular injections of these parasites and killed within two days. Dead specimens were present in the white rats, but none were found in the pigeons or frogs.

Tr.s. larvae were mixed with gastric juice to digest their capsules and injected (intramusc.) into frogs; the parasites did not develop and were dead within 28 days.

III. P. describes the comparative immunity set up in white rats by various heat-killed trichina antigens (Bachman, Schwartz, and Ströbel) and by living trichina obtained from the diaphragms of infected rabbits. Thirty rats were used for each test and as controls, all injections being intramuscular. Three lots of ten rats in each group received, 2, 4 and 6 *Tr.s.* respectively on the same day as the various antigens.

A rat from each group was killed and examined every day from the 30th day onwards and the amount of infestation found is tabulated. From these results, P. concludes that living trichina injected (intramusc.) into white rats promoted stronger immunity than the other forms of trichina antigens he tested.—C. V. W.

IMMUNITY.

Perz, A. (1937). Beitrag zur Technik der abgestuften Röhrchenagglutination. [**The Technique of Graded Tube Agglutination**].—*Z. InfektKr. Haustiere.* **51.** 313-335. 5 tables. [4 refs.]

Perz, A. (1937). Beitrag zur Technik der abgestuften Röhrchenagglutination. [**Technique of the Tube Agglutination Test**].—*Wien. tierärztl. Mschr.* **24.** 532.

Various methods of preparing serum dilutions for tube aggl. tests have been compared as regards the accuracy of the dilutions produced and the time taken in preparation. It is concluded that the most satisfactory method is to add a measurable amount of pure serum, *e.g.* 0·174 c.c., to a large amount of saline, *e.g.*, 2 c.c., in preparing the primary dilution. [In Great Britain it is commonly the practice to add 0·4 c.c. of serum to 1·6 c.c. of saline for contagious abortion tests. Working with so much serum pipetting errors are greatly reduced]. Ten-fold serial dilutions are then prepared by transferring 1 c.c. of the primary dilution to 1 c.c. of saline and so on. By putting up dilutions in this way pipetting errors are not great and tests can be put up more rapidly than if decreasing amounts of a ten-fold dilution of the pure serum are added directly to fixed amounts of antigen.—E. J. Pullinger.

Schmaltz. (1937). Der Grossversuch über Tuberkulose und Brucellose in Preussen. [**Results of Large Scale Testing for Bovine Tuberculosis and Brucellosis in Prussia**].—*Berl. tierärztl. Wschr.* Oct. 15th. 642-644. [1 ref.]

Cattle from 45,945 herds were subjected to the tuberculin test, more than half of these herds containing only five animals or less and 651 herds more than

50 animals. Of 105,531 bovines under one year old, 11·9 % gave positive tuberculin reactions, whilst of 306,653 adult animals, 37·9 gave positive reactions. About 60 % of all herds contained infected animals.

As regards brucellosis, 10·7 % of 216,367 animals tested for specific agglutinins gave positive results. Only 2·9 % of the males showed specific antibodies.

In the case of both diseases, the incidence of infection tended to be low or absent in very small herds, whilst the incidence was greater in larger ones.—E. J. P.

Russeff, C. (1937). Tuberkulin-Studien vom Standpunkt der Veterinärpräxis. I. Mitteilung. Beziehungen zwischen Tuberkulin- und Abortinallergie. II. Mitteilung. Ein neuer Vorschlag zur Auswertung des Tuberkulins. III. Mitteilung. Vergleich des Tuberkelbazillenwachstums in Glyzerin-bouillon und auf den synthetischen Nährböden von Dorset und Sauton sowie vergleichende Auswertung der entsprechenden Tuberkuline. V. Mitteilung. Kann des gereinigte Tuberkulin PPD. (Purified Protein Derivative) in starken Konzentrationen eine diagnostische Verwendung in der Veterinärpräxis finden ? VI. Mitteilung. Versuche zur Trennung des Gift- und Hautstoffes im Tuberkulin. [**Studies on the Tuberculin Test. I. Connexion between Allergy and Tuberculin and Abortion. II. A New Suggestion for the Standardization of the Tuberculin. III. Comparative Growth of Tubercle Bacilli in Glycerin Broth and on the Synthetic Media of Dorset and Sauton and Comparisons of the Respective Tuberculins. V. The Use of Purified Protein Derivative Tuberculin (PPD) in Veterinary Practice. VI. Attempts to Separate the Toxic and Skin-Reactive Substances in Tuberculin**].—*Z. InfektKr. Haustiere.* **51.** 114-129, 130, 137, 138, 150, 226-233 and 234-239. 7 figs., 16 tables. [Numerous refs.]

Russeff, C., & Henninger, E. (1937). Tuberkulinstudien vom Standpunkt der Veterinärpräxis. IV. Mitteilung. Das synthetische Tuberkulin als Diagnostikum zur Feststellung der Geflügeltuberkulose. [**Studies on the Tuberculin Test. IV. Use of Synthetic Tuberculin in Fowl Tuberculosis**]. —*Ibid.* 215-225. 5 tables. [18 refs.]

I. Tuberculin prepared by growing tubercle bacilli upon synthetic medium [*i.e.*, medium in which natural animal protein is replaced with amino-acid such as asparagine] is superior to that prepared with glycerin meat broth. When tested upon tuberculous g. pigs, synthetic tuberculin gave a higher proportion of true positive reactions than did ordinary " old tuberculin " ; furthermore, no doubtful reactions occurred. It is also concluded that the reactions of g. pigs to abortin and to tuberculin are not seriously affected when the animals are suffering from TB. and brucella infection at the same time, though non-specific allergic reactions may occur.

II. When tuberculin is being standardized it should be inoculated not only into both tuberculous and normal g. pigs, but also into others infected with *Brucella abortus*. In this way the normal specific positive reaction can be compared with any non-specific reaction which may be produced. [Any batch of tuberculin giving a marked non-specific reaction should of course be discarded].

III. Comparing the relative values of Dorset's and Sauton's synthetic media and glycerin meat broth for the growth of tubercle bacilli for tuberculin preparation, it was found that both mammalian and avian strains gave by far the most copious growth in Dorset's medium ; Sauton's came next in order of merit, whilst in glycerin meat broth the growth of mammalian tubercle bacilli was about one tenth of that in Dorset's medium and avian tubercle bacilli hardly grew at all. Incidentally the most sensitive tuberculin was produced in Dorset's medium.

V. Purified protein derivative is the essential active portion of the tuberculin separated by salt precipitation of that protein fraction which contains the bulk of the active principle, the precipitate being subsequently redissolved. This substance gives slightly better results than Dorset's synthetic tuberculin, but this difference is not sufficiently great to justify, for veterinary purposes, the greatly increased cost of production.

IV. As a diagnostic agent, avian tuberculin prepared upon Dorset's synthetic medium was superior to products prepared upon other media. It gave no false negative results, whilst positive reactions were sufficiently large to be easily recognizable. Chronic infection with *Salmonella pullorum* does not give rise to non-specific tuberculin reactions in non-tuberculous fowls.—E. J. Pullinger.

Campiglio, J., & Padilla, M. (1936). De la valeur diagnostique de l' " exotuberculine " (E.T.F.) dans le prophylaxie de la tuberculose bovine. [**Diagnosis of Bovine Tuberculosis with Exotuberculin**].—*Rec. Méd. vét.* **112.** 712-715. [4 refs.]

The authors tested 120 tuberculous cattle with varying doses of exotuberculin either by the intramuscular or intraperitoneal route. All the animals gave typical general reactions, whereas control animals gave no reactions.

From their researches the authors conclude that in all tuberculous animals, whether early or advanced, in good condition or cachectic, exotuberculin can be relied upon to give clear and definite reactions.—Gwilym O. Davies.

Beller, K. (1937). Zur Frage der Allergen-Auswertung. [**The Question of Allergy**].—*Z. InfektKr. Haustiere.* **51.** 336-343. 1 table, 6 charts. [3 refs.]

Out of 120 cattle tested simultaneously with tuberculin, abortin and mallein positive results were obtained in 72·5, 11·7 and 30% of cases respectively, doubtful results in 13·3, 6·7 and 47·5%, and negative in 14·2, 81·6 and 22·5%. Whilst the percentage of positives obtained with tuberculin and abortin were reasonable, in the case of mallein non-specific reactions were obviously occurring, and B. discusses the significance of such reactions. Charts are appended indicating the daily progress of the skin reaction following the intradermal injection of the three allergins. In all cases any non-specific reaction reached its height during the first 24 hours after injection, whereas the positive tuberculin reaction never reached its height before the second day and in exceptional cases not until the fifth to seventh day.—E. J. Pullinger.

Downie, A. W. (1937). **A Comparison of the Value of Heat-Killed Vaccines and Toxoid as Immunising Agents against Experimental Staphylococcal Infection in the Rabbit.**—*J. Path. Bact.* **44.** 573-587. 13 figs. on 3 plates, 2 tables. [Numerous refs.]

D. immunized groups of rabbits with heat-killed suspensions of staphylococci or formolized filtrates from cultures of the same strain. The former failed to produce antitoxin in most of the rabbits, but the latter did produce it. When the vaccines were given intravenously the sera of the rabbits gave positive precipitation and c.-f. reactions with extracts of staphylococci, but when given subcutaneously such antibody production was irregular. Injections of culture filtrates produced α-haemolysin antibodies and precipitins for culture filtrates, but neither precipitins nor complement-fixing antibodies for bacillary extracts.

D. describes and illustrates by photomicrographs the skin lesions in control rabbits and in rabbits after infection of toxic filtrates and living staphylococci. Rabbits previously given heat-killed vaccine behaved as normal rabbits, whereas

rabbits previously treated with formolized filtrates had much less extensive lesions, and phagocytosis was more active.

He suggests that, in the absence of a sufficient concentration of antitoxin in the rabbits, the toxin produced at the site of injection of living cultures immobilizes the cellular defensive reaction.—C. V. Watkins.

Guenther, D. F. (1937). Einfluss der immunisatorischen Prozesse auf den Stoffwechsel. **[Influence of Immunization Processes on Metabolism].**—*Tierärztl. Mitt.* **18.** 675-677. [14 refs.]

A very brief discussion of the influences exerted by immunization processes upon the cell metabolism. Examples considered include the increase of blood globulin which occurs during immunization, the cell damaging effect of many foreign proteins, and the rise and fall of the blood sugar level which occurs during the course of infectious disease.—E. J. Pullinger.

Favilli, G., & McClean, D. (1937). **The Influence of Tissue Permeability on Local Immunity.**—*J. Path. Bact.* **45.** 661-680. 5 tables. [Numerous refs.]

Besredka and co-workers claim that a specific local immunity can be acquired by the skin. A factor in testicular extracts when injected into the skin causes an immediate increase in its permeability, but when broth and bacterial filtrates are previously injected (intraderm.) the diffusibility of testicular extract is inhibited, although their injection does not inhibit the diffusibility of indian ink. The inhibition was not due to any direct action on the permeability of the cells, but was found to be associated with the early stages of inflammation. It was concluded that local skin immunity is not a specific immune response, but is primarily associated with the early stages of inflammation.—H. E. Bywater.

von Obernberg, H. (1937). Der Einfluss der Sörensenschen Pufferlösungen auf die Wärme- und Saponinhämolyse. **[Influence of Sorensen's Buffer Solutions on Haemolysis Caused by Warmth and Saponin].**—*Arch. wiss. prakt. Tierheilk.* **72.** 109-115. 4 tables. [5 refs.]

A general discussion of the phenomenon of haemolysis. The rate of haemolysis of erythrocytes by heat and by saponin is influenced considerably by the nature of the buffer solution used for suspending the corpuscles. Over certain pH ranges these buffers inhibit the haemolytic action, greatest inhibition generally occurring at about pH 6·6.

In the case of bovine erythrocytes, haemolysis by heat (about 60°C.) is greatly retarded by glycocholic acid over a wide pH range, by citrate buffer over a narrower range and by phosphate and borate only at about pH 6·6. In the case of equine erythrocytes inhibition occurs over similar pH ranges, but it is much less marked.

Most inhibition of saponin haemolysis occurs in the slightly alkaline pH ranges. In this case borate produces inhibition over the widest pH range followed by glycocholate, citrate and phosphate respectively. In this case also horse blood is less susceptible to inhibition than bovine.—E. J. Pullinger.

DISEASES, GENERAL.

Anon. (1938). **Report of the Committee on Miscellaneous Transmissible Diseases.**—*J. Amer. vet. med. Ass.* **92.** 433-441.

This report deals with Infectious Equine Encephalomyelitis and Anthrax, and contains a brief reference to Foot and Mouth Disease in countries outside

the U.S.A. From the summary given it would appear that EQUINE ENCEPHALOMYELITIS is spreading in the U.S.A. and it is estimated that during the past season there were more than a hundred thousand cases of the disease, with a mortality of about 30%. Preventive measures based on the assumption that the disease is transmitted by biting insects gave good results. Serum and vaccine inoculation were used extensively, but reports from the field are not yet available. Reference is made to a virulent outbreak of ANTHRAX in South Dakota and Nebraska. The U.S.A. and bordering countries remain free from F. & M. DISEASE.—N. J. SCORGIE.

SICKMÜLLER, E. (1937). Neue Krankheitsbetrachtung und neue Krankheitsbekämpfung. [**New Ways of Regarding Diseases and Their Control**].—*Z. InfektKr. Haustiere.* **51.** 240-252.

An interesting and stimulating discourse which is, however, unsuitable for abstraction. The theme is that resistance of domestic animals to disease can be raised by intelligently planned breeding methods, and that such breeding methods should be developed as the veterinary counterpart of the present German " race purity " campaign.—E. J. PULLINGER.

STROH, G. (1937). Nach Para. 32 des Reichsjagdgesetzes anzeigepflichtige Wildseuchen und deren Bekämpfung. [**Notifiable Diseases of Wild Game in Germany**].—*Berl. tierärztl. Wschr.* June 25th. 400-402. [4 refs.]

In Germany there are at least 30 notifiable diseases of game, the principal ones being foot and mouth disease of cloven-footed animals (deer, wild pig, etc.), swine plague and swine fever, sarcoptic mange of chamois, and tularaemia of rodents. Control measures include shooting a considerable number of hinds in the autumn and a lesser number in the winter, together with kids of both sexes ; also thorough destruction of carcasses, drainage of swamps, careful winter feeding, and protection of birds which devour insects. Medical control measures play a subordinate part. Lectures on diseases of game are, whenever possible, given to foresters during their course of studies.—M. BURKE.

SMITH, P. R. B. (1937). **Diseases Transferable to Man from Domestic Animals.**—*S. Afr. med. J.* **11.** 43-47.

In this article the importance of certain diseases of domestic animals transferable to man is stressed. The particular diseases dealt with are tuberculosis, rabies, anthrax, glanders, brucella infections, food poisoning from paratyphoid organisms, psittacosis, etc. No new information is given.—E. M. ROBINSON.

AMBROSIONI, P. (1937). Breve relazione sulle ricerche eseguite negli anni 1935-1936 su materiale patologico del Giardino Zoologico di Roma. [**Diseases of Animals in Rome Zoological Gardens, 1935-1936**].—*Clin. vet., Milano.* **60.** 189-193.

Polar bears in the Gardens are liable to sarcoptic mange. Two gazelles died from anthrax and a seal from pasteurella infection. A well developed orang-utang died from infestation with *Strongyloides stercoralis* after an illness of only four days.

In the bird section, one royal falcon died from avian TB. and a consignment of *Amandara amandara* recently imported from India were infected with *Salmonella typhi-murium* and microfilaria.—J. A. NICHOLSON.

SCHIEL, O. (1937). Untersuchungensergebnisse von Zootieren im Veterinär-Untersuchungsamt Oppeln. [**Causes of Death in some Zoo Animals**].—*Tierärztl. Rdsch.* **43.** 536-537.

Between 1931 and 1936 the carcasses of 34 animals of all kinds from a zoo

were examined. In 41·2% inflammation of a non-specific kind was found in the stomach and intestinal canal. Some of the possible causes suggested were, faulty feeding owing to lack of trained staff in the zoo, consumption of—possibly—diseased dead animals, and food given by visitors. Other diseases diagnosed were acute miliary TB., paratyphoid, helminthiasis, aspergillosis, lungworm infestation, diplostreptococcal infection and non-specific pneumonia.—M. BURKE.

I. GORDON, R. F. (1937). **Summary of Diseases Diagnosed in Chicks Received at the Ministry of Agriculture and Fisheries' Veterinary Laboratory during the Four Years, January, 1933, to December, 1936.**—*Vet. Rec.* **49.** 1377-1379. 7 tables.

II. GREENWOOD, A. W. (1937). **Constitutional Vigour in Poultry.**—*Emp. J. exp. Agric.* **5.** 32-38. 5 tables.

III. ANON. (1937). **Report of the Special Committee on Poultry Diseases.**—*J. Amer. vet. med. Ass.* **91.** 443-445.

IV. ANON. (1936). **German Egg Laying Trials, 1934-35.**—*Harper Adams Util. Poult. J.* **21.** 472-474. 3 tables.

I. This summary is a good index to the common diseases of chicks, turkey poults, goslings, ducklings and game chicks.

In the four years surveyed, 1,505 batches of chicks were examined. The most important single cause of death was *Salmonella pullorum* infection, accounting for 32% of the chicks dealt with. This percentage altered little from year to year, which is surprising considering the increase in blood testing. Acute caecal coccidiosis occurred in 19% of the chicks examined. The most important item was that termed " miscellaneous diseases ", in which were included brooder pneumonia, chilling, feeding errors and similar conditions due to bad management. These conditions accounted for 43% of the total over the four years.

While the number of *S. typhi-murium* and *S. enteritidis* infections diagnosed was not high, it must be remembered that dead chicks from infected premises may represent losses up to 100% of the stock. Where rickets occurred, usually only a few chicks were affected. The commonest specific disease in ducklings was *S.t.-m.* infection, in turkey poults, blackhead, in goslings, gizzard worm infestation, and in game chicks, coccidiosis and gapeworm infestation.

II. G. discusses the possible definitions of the terms commonly used by poultry breeders, " stamina ", " constitutional vigour " and " liveability ". " Stamina " may be defined as the ability of a bird to resist variations in its environment. " Liveability " is applied to birds which remain alive a considerable number of years. Birds may possess both these qualities and still be an uneconomic proposition. On the other hand " constitutional vigour " is taken to mean the ability of a bird to maintain a certain level of bodily functioning for a period of time longer than that normally characteristic of the average hen. [The term " liveability " apparently means " longevity "].

Taking an arbitrary standard of vigour of not less than 140 eggs in the third year of production, G. analyses the production and breeding records of the stock of Brown Leghorns at the Institute of Animal Genetics, kept under a rigidly controlled intensive system, that is to say, in a controlled environment.

III. In this report the activities of the National Poultry Improvement Plan are outlined, amongst which are eradication of *S.p.* infection and improved methods of production, breeding and rearing. This plan is concerned with nearly 6½ million breeding birds.

The importance of mortality not due to infectious disease in adult fowls is stressed. On some farms this amounts to nearly 40% of the birds. The questions

of poultry disease nomenclature and the standardization of methods for diagnosing *S.p.* infection have been considered. Information concerning the literature is being collected.

IV. The German Egg-Laying Trials are divided into two types as in England :– (1) tests in which the individual birds are selected by the competitors themselves for entry, and (2) flock tests, the birds being selected by an official of the agricultural association. These trials are held separately in five centres for each. A total of 1,974 birds were entered, 76·5 % of the entries being White Leghorns. Details of rations and production are given. Diseases of the reproductive and urinary systems accounted for 31 % of the deaths. Virus diseases, including leucomyelosis [presumably lymphomatosis and leucaemias] accounted for 21 % and digestive troubles for 16·4 %.—D. L. Hughes.

Gimpret, J. (1937). Fièvre aphteuse et theiléríose bovine. [**Foot and Mouth Disease and Theileriasis**].—*Maroc méd.* **17.** 417-421.

It has long been known that F. & M. disease, in that it lowers the resistance of affected animals, precipitates acute attacks of piroplasmosis and especially of theileriasis in carriers of these diseases. In 1937 a severe type of F. & M. disease was experienced in Morocco, and details of observations made on three farms where the disease was associated with acute theileriasis are described. A mild type of F. & M. disease appeared first and soon disappeared, but a severe type broke out a few months later. A number of more severely affected animals were found to be suffering from acute theileriasis. The mortality was not so high in cattle which had been premunized. Variation was observed in the virulence of the theileria and it is suggested that cattle in Morocco should be vaccinated with virulent local strains. Fatal attacks also occurred in calves a few weeks old. Symptoms were masked by those of F. & M. disease and diagnosis was thereby retarded. Gonacrine was found very efficacious in treating the acute attacks of theileriasis, but had no effect on F. & M. disease or on the more chronic theileria infections.—S. J. Gilbert.

Marsh, H., & Tunnicliff, E. A. (1937). **Stomatitis in Young Lambs Involving Actinomyces necrophorus and the Virus of Contagious Ecthyma.**—*J. Amer. vet. med. Ass.* **91.** 600-605. 4 figs. [2 refs.]

An outbreak of soremouth occurred in lambs 3-4 weeks old and was found to be due to the virus of contagious ecthyma complicated by infection with *Fusiformis necrophorus*. The main lesions, composed of granulation tissue with white necrotic patches, were on the buccal mucous membrane and could be reproduced experimentally by the local injection of unfiltered material from natural cases. The injection of filtrates did not cause lesions on the buccal mucosa, but produced characteristic ecthyma on the lips.—P. S. Watts.

Mathews, F. P. (1937). **Photosensitization and the Photodynamic Diseases of Man and the Lower Animals.**—*Arch. Path.* **23.** 399-429. [Num. refs.]

This is an extensive and critical review of the literature on experimental and spontaneous photosensitization. M. points out that in experimental sensitization of animals to fluorescent dyes such as eosin, injection of the dye followed by direct exposure to sunlight is necessary ; oral administration is not effective.

Similarly with alcoholic extracts of many plants which have a photodynamic action, injection followed by exposure to sunlight is necessary. Various conditions in animals such as fagopyrism (buckwheat poisoning), St. John's wort poisoning,

trifoliosis (clover disease), Sudan grass poisoning, " geeldikkop " (tribulosis), " bighead " of sheep in the U.S.A. and lecheguilla fever in goats [*V. B.* **1.** 322.] are discussed. M. does not consider that pellagra is due to photosensitization ; the sensitivity to light is secondary to the dermatitis, as is the case in lupus and acne. Mention is made of two excellent reviews, one by BLUM [(1932). *Physiol. Rev.* **12.** 89.] and the other by HAUSMANN and HAXTHAUSEN [(1929). Die Lichterkrankungen der Haut. Strahlentherapie. Vol. 11. Berlin : Urban & Schwarzenberg].

—C. MCGAUGHEY.

JOHNSON, L. V. (1938). **A Pannus-Forming Infection of Sheep Eyes.**—*Proc. Soc. exp. Biol., N.Y.* **38.** 42-43. [1 ref.]

A large proportion of sheep in a certain flock suffered from a transmissible eye disease. It appeared to be associated with cold weather, to have an incubation period of 48 hours and to be marked by extensive pannus formation. No pathogenic bacteria were recovered, but structures morphologically identical with *Rickettsia conjunctivae* were noted.—P. S. WATTS.

I. HOFLUND, S. (1937). Orientering över sjukdomen nyssjuka (rhinitis chronica atroficans) hos svin ur klinisk synpunkt. [**Chronic Atrophic Rhinitis in Pigs**].—*Svensk VetTidskr.* **42.** 189-210. 4 figs. [Numerous refs.] [English summary].

II. THUNBERG, E. (1937). Bidrag till nyssjukans etiologi. [**Aetiology of Rhinitis in Pigs**].—*Ibid.* 360-363.

III. HOFLUND, S. (1937). Nyssjukans etiologi. [**Aetiology of Rhinitis in Pigs**]. —*Ibid.* 364-368. [1 ref.]

I. H. gives a general review of earlier work on a disease in pigs, the popular name of which is " sneezing disease " [Schnüffelkrankheit] an affection which, he states, is scarcely known in English literature. Emphasis is laid upon the work of JENSEN [(1916). *Maanedsskr. Dyrlaeg.* **28.** 277]. According to the latter 5-10% of the pigs in Denmark were affected. Although not so common in Sweden, it has become fairly frequent in some parts of the country during the past few years, particularly in some highly bred herds. The affection is quite well known in Germany.

H. has been able to study the disease as it occurs in some herds in the neighbourhood of Stockholm, and gives a detailed clinical description of it. The course is remarkably chronic. Only occasionally do the affected animals show symptoms of general disturbance, but they are adversely affected in growth and thriftiness.

The symptoms usually set in at the age of about 2-3 months, though in exceptional cases as early as 5-6 days, and commence with a persistent sneezing, followed by a more or less profuse nasal discharge, which is purulent and often blood-stained. As the animal grows larger, a peculiar malformation of the nasal region (bulldog nose) becomes more and more predominant.

On X-ray or P.M. examination the malformation is observed as an atrophy of one or both of the nasal conchae. This conchal atrophy may also be seen in some cases that have never shown real clinical symptoms.

As to the cause of the disorder, two theories are advocated :– (1) a primary infectious rhinitis (*Pseudomonas pyocyanea* has been incriminated, but *Corynebacterium pyogenes* mixed with streptococci were most frequently found) followed by secondary atrophy, and (2) a hereditary defective development of the conchae, which becomes particularly noticeable as the nose of the pig develops, followed by a secondary rhinitis of bacterial origin.

Although no convincing conclusion can be drawn, observations made in a particular herd lead H. to consider the latter theory as the more probable.

II. From observations made in a pedigree swine herd kept under his special supervision and formerly quite free from " sneezing disease " T. does not agree with HOFLUND that heredity is the more important aetiological factor. On the contrary, he considers that the ailment is of a definitely infectious nature. This is because it was brought into the herd in question by a young breeding boar that came from a herd where the disease was known to exist, and broke out among sows and their litters before that particular boar was used for breeding purposes, infection being presumed to have developed from contact.

III. H. replies to THUNBERG and attempts to show that some of the latter's conclusions may be open to criticism. He maintains that the hereditary factor is primary and looks upon the infection as secondary. In support of this view he quotes a recent paper by TIEDGE, who renounces the theories of infection and mineral deficiency and, on the contrary, states that " Schnüffelkrankheit " constitutes a typical hereditary condition [*V. B.* **8.** 39].—GUSTAV NAERLAND (OSLO).

MENZANI, C. (1937). Di una particolare forma infetivo-contagiosa dei bovini a tipo cruposo-difterico. [**Croupous-Diphtheritic Rhinitis and Conjunctivitis in Cattle**].—*Clin. vet., Milano.* **60.** 669-682. 2 figs. on 1 plate. [13 refs.]

M. describes an acute infectious disease of cattle in which the main symptoms were photophobia, lachrymation, inflammation of the conjunctiva and nasal mucous membrane and diarrhoea. In acute cases death occurred in 24-36 hours. P.M. there was acute congestion of the nasal, pharyngeal and tracheal mucosa, intense haemorrhagic gastro-enteritis, enlargement of the spleen, and degenerative changes in the liver and kidneys.

A gram-positive diplococcus was isolated in pure culture from the retro-pharyngeal lymph nodes which proved pathogenic for g. pigs, but not for calves. The disease could only be transmitted to healthy calves by injecting blood taken during the early stages of an acute attack. M. concludes that the animals were suffering from a virus disease resembling malignant catarrhal fever.—J. A. N.

BODIN. (1937). Broncho-pneumonies infectieuses chez les bovins. [**Infectious Broncho-Pneumonia of Cattle**].—*Bull. Soc. vét. prat. Fr.* **21.** 135-137.

Numerous cases of infectious bovine broncho-pneumonia have been observed in the central districts of France. Mortality sometimes reaches 20-30%. Outbreaks occur with a newly-introduced animal in which symptoms first appear. A pasteurella was considered to be the cause of the infection. [The condition appears to resemble " shipping fever "].—S. J. GILBERT.

GAUS, O. (1937). Gallengangszystenleber (Riesenleber) und Zystennieren bei einem Kalbe. [**Cystic Liver Due to Proliferation of Bile Ducts (Giant Liver) and Cystic Kidneys in a Calf**].—*Dtsch. tierärztl. Wschr.* **45.** 798-800. [9 refs.]

A case of hypertrophic cirrhosis is recorded in a three-week-old calf. Proliferation of the bile ducts had produced multiple cystic structures containing inspissated bile. Both kidneys were sponge-like, the renal cortex containing a large number of cysts. It is considered that both conditions represented developmental errors, although hypertrophic cirrhosis has been described in the calf as resulting from paratyphoid infection. Cultural examination was negative in the case described.—E. G. WHITE.

Delpy, L., & Kaweh, M. (1937). Nevraxite enzootique des jeunes chevreaux. [**Encephalomyelitis of Young Goats**].—*Bull. Acad. vét. Fr.* **10.** 332-338. 1 table. [Numerous refs.]

For some years past a nervous disease of young goats and sheep has been known to occur in different parts of Iran, but an opportunity to investigate an outbreak had not been afforded prior to the spring of 1937. In a mixed flock of sheep and goats only young goats were affected. A number of these were taken for laboratory observation, including apparently healthy animals, slightly affected ones, and some in the stage of paralysis. Very few ticks could be found on any of these animals, only some adult *Rhipicephalus appendiculatus* being located. It has not been possible to ascertain the incubation period of the disease. The first symptoms consist of dullness and incoordination ; later the animals remain lying down with the legs stretched out and with opisthotonos, and appear to be unconscious. There is constant fever, and death occurs towards the eighth day. Lesions are found in the brain, meninges, spinal cord and kidneys. All except one case proved fatal. Examinations of blood and organs did not reveal the presence of bacteria or protozoa, and cultures were negative. A number of inoculations of brain and blood into lambs and kids were negative though one result was doubtful. The disease could not be transmitted experimentally by ticks. A comparison with other published descriptions of nervous affections of young ruminants is made. —S. J. Gilbert.

I. Carré, H., Thiéry, J., & Bonnet, M. (1936). Une enzootie d'ostéite hypertrophiante chez le mouton. [**Enzootic Hypertrophic Ostitis in Sheep**]. —*C. R. Soc. Biol. Paris.* **123.** 557-558.

II. Carré, H., Thiéry, J., & Bonnet, M. (1936). Sur l'étiologie de l'ostéite hypertrophiante. [**Hypertrophic Ostitis – Aetiology**].—*Ibid.* 558-559.

I. An outbreak of lameness in a flock of 6-month-old lambs was found on anatomical and bacteriological examination to be due to hypertrophic ostitis. This is the first record of its occurrence in sheep.

II. The authors were not able to show any bacterial cause of the disease by culture methods in the outbreak described in I. In a lamb injected intravenously with material from a lesion, however, a temperature rise was observed after 20 days and they think an infective agent was responsible.—P. S. Watts.

Ueberreiter, O. (1937). Zungengrundcysten beim Pferde. [**Cysts of the Base of the Tongue in the Horse**].—*Berl. tierärztl. Wschr.* July 9th. 434-436. 2 figs. [Numerous refs.]

A description of three cases of cyst of the base of the tongue in horses :– a two-year-old colt, a heavy working horse, and a horse examined after slaughter. The colt, which showed difficulty in swallowing and respiration, was cured by operation, but the second horse died of asphyxia. U. considers that lesions were due to retention cysts arising from the embryonic thyroglossal duct.—F. F. (Hamburg).

Schofield, F. W. (1935). **Convulsions in Suckling Calves.**—*Rep. Ont. Vet. Coll., 1934.* pp. 22-23.

Attention is drawn to a highly fatal disease of young calves, with sudden onset and marked by bellowing, running about blindly, falling with severe convulsions, and death within a few hours or sometimes within 10-15 minutes of the onset of the attack. In all cases there was definite evidence of cerebral congestion, though no haemorrhages were observed, and some evidence indicating gastro-intestinal disturbance. No investigation with regard to aetiology or treatment has been made.—E. A. Watson,

Drieux, H., & Mendoza, M. A. (1937). Quelques observations de neurofibromatose chez les bovidés. [**Bovine Neurofibromatosis**].—*Bull. Acad. vét. Fr.* **10.** 59-73. 4 figs. [5 refs.]

Multiple tumours of peripheral nerves corresponding to Recklinghausen's disease in man are known to occur in domestic animals, most commonly in bovines. The histopathology of the condition in animals has not as yet received careful attention using modern neuropathological methods.

No examples of peripheral gliomata, of which three types are recognized in man, were found in the material examined, which comprised seven cases of neurofibromatosis in cattle from the abattoirs of la Vilette. The areas of cutaneous pigmentation, and lesions of the central nervous system, meninges and acoustic nerve recorded in man are not found in animals. In the latter, the lesions are restricted to nerve trunks, plexuses and the spinal nerve roots.

The histological structure of the lesions affords striking confirmation of Masson's work on neurofibromatosis in man, the lesions resulting from proliferation of the cells of Schwann (peripheral neuroglia). Other workers have considered the axis cylinder, endoneurium and perineurium as possible sources of the lesions, but the views of Masson are now fairly generally accepted by pathologists.

The influence of embryology and heredity will form the subject of future work.—E. G. White.

Claussen, L. (1937). Ein Fall hochgradiger Milzinduration bei chronischer aleukämischer Lymphadenose des Rindes. [**Induration of the Spleen in Chronic Aleucaemic Lymphadenosis in Cattle**].—*Dtsch. tierärztl. Wschr.* **45.** 573-574. 3 figs. [2 refs.]

A case of aleucaemic lymphadenosis is described in an aged cow. The spleen was considerably enlarged and extremely tough. Histological examination revealed an extreme degree of fibrosis together with evidence of lymphadenosis. No record of marked splenic fibrosis in bovine lymphadenosis was found in the literature. —E. G. White.

Potel, K. (1937). Hyalin-schollige Degeneration der Skeletmuskulatur bei Küken und Junghühnern. (Ein differentialdiagnostischer Beitrag zur Marekschen Geflügellähme). [**Hyaline Degeneration of the Skeletal Musculature of Chicks. Differentiation from Fowl Paralysis**].—*Arch. wiss. prakt. Tierheilk.* **72.** 216-223. 2 figs. [12 refs.]

A description of two outbreaks of severe paralysis in small poultry flocks with symptoms resembling fowl paralysis. In one flock, four adult hens died following paresis of the limbs; no eye lesions were observed. In the other flock, four five-week-old chicks were similarly affected, but not fatally. One chick was killed and examined at the laboratory. In each case there was macroscopic evidence of severe degeneration of the breast and leg muscles, and in the chicks similar changes were found in the musculature of the neck, back and wings. There were no lesions of any other organs or tissues, including the C.N.S., either macroscopically or on histological examination. Bacteriological examination gave a negative result.

The affected muscles showed hyaline degeneration, fragmentation and dystrophic calcification, with secondary cellular infiltration and attempts at regeneration.

There appeared to be no evidence of any dietary deficiency, nor was there any suspicion of poisoning.

No further cases occurred when the amount of food given was reduced and a larger run provided. The precise aetiology could not be determined; excessive protein feeding is suggested as a contributory cause.

The absence of any lesions of the peripheral or C.N.S. and the occurrence of the disease in very small chicks are considered sufficient to exclude the possibility of fowl paralysis. It is probable that the cases recorded by GLAGE [(1923). *Berl. tierärztl. Wschr.* **39.** 403-406.] represented a similar condition, although no histological examination was made.—E. G. WHITE.

MADSEN, D. E. (1937). **The Effect of Iritis of Breeding Hens on Their Progeny.** —*Poult. Sci.* **16.** 393-397. [9 refs.]

In a stock of 1,100 birds 11% were found showing the eye lesions associated with fowl paralysis. A number of affected hens were mated with normal males, and of the chickens hatched, 27 pullets were reared to maturity. One developed the eye lesion and four others showed a condition which M. speaks of as " indistinct eyes ", the edge of the iris being blurred. The 27 pullets were mated with four males, two of which had " indistinct eyes ", and of the chickens, 70 were under observation until from 10 to 13 months old. One of these developed leg paralysis and one showed " indistinct eyes ".—W. J. IRONSIDE.

WITZIGMANN, J., & KREMBS, J. (1937). Einige Fälle von Erkrankungen des endokrinen Systems beim Hund. [**Some Cases of Endocrine Disease in Dogs**].—*Arch. wiss. prakt. Tierheilk.* **72.** 151-157. 3 figs. [5 refs.]

In a 21-month-old Scottish terrier bitch with marked general adiposity, tuberculosis of the thyroid glands and kidneys was found at autopsy. No lesions were found in any other organs. [Examination for tubercle bacilli was not made. It is difficult to understand how primary TB. of the thyroid or kidney can occur, as neither organ is easily accessible as a portal of entry for the tubercle bacillus].

A case of tetany in a five-year-old Alsatian mongrel dog is considered to have been due to hyperaemia of the parathyroids, demonstrated at autopsy.

General adiposity in a five-year-old, male, long haired dachshund was temporarily cured by administration of thyroid extract (" Elityran "); no permanent benefit resulted. At autopsy, there was found marked atrophy of the thyroid glands with replacement fibrosis.—E. G. WHITE.

BAKOS, K. (1937). Lovak melanoblastomáiról. [**On Melanoblastomata of Horses**].—*Állatorv. Lapok.* **60.** 240-243. [18 refs.]

A case record of generalized melanosarcoma affecting almost every organ including the brain and bones of a horse.—Z. DE CSUKÁS (MAGYARÓVÁR).

INSKO, W. M., Jr., & LYONS, M. (1936). **The Effect of Cod Liver Oil in the Diet of the Mother Hen, on Embryo Mortality and on the Calcium and Phosphorus Content of the Embryo.**—*Rep. Ky agric. Exp. Sta., 1936.* Pt. II. pp. 63-81. 3 figs., 8 tables. [18 refs.]

Confined pullets with no cod liver oil supplement produced eggs showing a higher embryo mortality during the third week of incubation than those from pullets exposed to sunshine or allowed blue grass range, but addition of cod liver oil to the diet of pullets under those conditions decreased the embryo mortality, the decrease being most marked in the confined pen.

The Ca and P content of the embryos from the eggs of the confined pullets receiving no cod liver oil was consistently less after the 16th day than that of the embryos from the other pens; the greatest difference occurred on the 18th and 19th days of the incubation period, which coincides with the peak of embryo mortality during the last week of incubation.—R. ALLCROFT.

Dols, M. J. L. (1936). Ueber die Wirkung von Dorschlebertran, Thunfischleberöl und bestrahlten Cholesterin- und Ergosterin-Präparaten bei der Geflügelrachitis. [**The Action of Cod Liver Oil, Tunny Liver Oil, Irradiated Cholesterol and Ergosterol Preparations in Rickets in Fowls**].—*Z. Vitaminforsch.* **5.** 161-169. 5 tables. [19 refs.] [Transl. from abst. in *Jber. vet. med.* **60.** 608].

Experiments on rats and chicks fed a diet producing rickets showed that 2% cod liver oil, or a quantity of tunny liver oil or irradiated cholesterol which, measured in vitamin D rat units, corresponded to 2% cod liver oil, was sufficient to protect chicks effectively against rickets. On the other hand it was established that an amount of irradiated ergosterol corresponding to 20% cod liver oil did not protect chicks against rickets. From these findings it follows that the vitamin D in cod liver oil must be a different substance from that obtained by the irradiation of ergosterol. It is further concluded that the vitamin obtained by irradiation of cholesterol cannot be produced from ergosterol.

Lease, Jane G. (1937). **Prevention by Egg Yolk of the Dermatitis in Chicks Due to Egg White.**—*Poult. Sci.* **16.** 374-377. 1 table. [12 refs.]

This condition of dermatitis gives rise, after three weeks, to scabby areas at the corners of the mouth and in 4-5 weeks to hardening and cracking of the skin on the feet.

Experimentally, the condition was induced when egg white formed 5% of the ration, and was prevented by the addition of extract of egg yolk only when added in such quantities that the amount of egg yolk present was 5-10 times the amount of egg white.—W. J. Ironside.

PUBLIC HEALTH.

Loat, L. (1937). **Pasteurisation of Milk. The Case against Compulsion.** pp. 32. London: National Anti-Vaccination League. [8vo] [3d.]

Quotations are given from a variety of sources and conclusions drawn therefrom in an attempt to prove that, in the interests of public health, milk should not be pasteurized.

The booklet is a partisan account of the question, presumably written for the masses, and statements made are at variance with common scientific knowledge.
—H. E. Bywater.

Mattick, A. T. R. (1937). **High Temperature Short Time Pasteurisation by the Aluminium Plant and Vessel Company's Plate Machine. Experiments in the Destruction of Tubercle Bacilli and Streptococci.** pp. 6. 3 tables. Reading: National Institute for Research in Dairying. [8vo].

Commercial milk, in 100 gallon quantities heavily inoculated with bovine tubercle bacilli and with human and animal strains of haemolytic streptococci, was found to be free from either organism after heating in the Aluminium Plant and Vessel Company's Plate Machine :– (a) to 160°F., and holding at this temperature for 15 seconds, using the old type of cast plates, and (b) to 164°F., with and without holding for 15 seconds, using a new type of pressed sheet metal plate designed to give quicker heating and to allow of a higher temperature without affecting the cream line.—H. E. Bywater.

TENHAEFF, C., & FERWERDA, S. (1937). De statistiek van de vleeschkeuring in Friesland. [**Meat Inspection Statistics for Friesland**].—*Tijdschr. Diergeneesk.* **64.** 171-182. 2 tables, 2 graphs. [3 refs.]

Statistics are given on the number of animals condemned at meat inspection when killed in the ordinary way at abattoirs and on those slaughtered in emergency, the latter being dealt with by a firm of animal product manufacturers. Figures are given for 300 horses, 1,600 cattle, 3,400 sheep, 600 goats and 2,500 pigs. The number of animals condemned after normal slaughter was in each case far below 1%. In those slaughtered in emergency the numbers condemned came to 15% of the horses, 28% of the cattle, 12% of the sheep, 10% of the goats and 12% of the pigs. Comparisons are made with certain local German statistics with regard to the number of animals lost through disease.—A. W. MÖLLER.

MEYER, R. (1937). Zur Statistik der Fleischvergiftungen im Jahre 1936. [**Meat Poisoning Statistics for 1936 in Germany**].—*Z. Fleisch- u. Milchhyg.* **47.** 474-479. 4 tables.

M. differentiates between true meat poisoning and food poisoning, the former being due to *ante-mortem* infection of the animal by *Salmonella typhi-murium* and *S. enteritidis*, the latter to P.M. contamination with *e.g.* other varieties of *Salmonella*, *Bacterium coli*, different cocci or *Clostridium botulinum*.

During 1936, 108 cases of meat poisoning were encountered, involving 1,804 cases of illness and 14 deaths. There was a seasonal incidence, the larger number of cases occurring from May to October (82 cases). In most cases the meat responsible was from cases of emergency slaughter, in which bacteriological meat inspection was not carried out. According to the Meat Inspection regulations the meat inspectors responsible were tried by civil and professional courts. Goose flesh caused five epidemics, from which *S.t.-m.* and *S.e.* in pure culture were isolated. Fifty epidemics of poisoning were due to infection of ducks' and hens' eggs with *S.t.-m.* and *S.e.* Only in 8·3% were genuine meat poisoning bacilli found, whilst the majority of epidemics were brought about by P.M. infection of the meat, partly by carriers or as a result of unhygienic conditions during storage and handling.—M. F. BENJAMIN.

UNGER. (1937). Eine Paratyphus-B-Infektion nach Genuss von Pferdefleisch. [**Paratyphoid B Infection from Ingestion of Horse Meat**].—*Z. Fleisch- u. Milchhyg.* **47.** 422-423.

Within a fortnight 50 people fell ill in Basle with abdominal symptoms. All had eaten horse meat traceable to one source. Meat poisoning was suspected, but the bacteriological examination of remains of meat both from the households and the source could not demonstrate the presence of the usual meat-poisoning bacteria. In the stools of several diseased people *Salmonella paratyphi* B was isolated and it is suggested that there was a P.M. infection of the meat from human carriers. *S.p.* B was isolated from an employee who handled the meat, a young man who had suffered from enteritis two years previously, and it is suggested that the meat was contaminated from this source after slaughter.—M. F. BENJAMIN.

SCHWARZ, G. (1937). Der Vollzug der Fleischbeschau und Trichinenschau in Bayern unter Berücksichtigung des zweiten Gesetzes zur Aenderung des Fleischbeschaugesetzes und der Verordnung vom 5.5.1937 zur Aenderung der Ausführungsbestimmungen A zum Fleischbeschaugesetz. [**Changes in the Meat Inspection and Trichina Inspection Law in Bavaria**]. —*Münch. tierärztl. Wschr.* **88.** 348-353.

The chief changes in the law relating to meat inspection are :– (1) dogs and other carnivores (wild animals) whose flesh is intended for human consumption must be examined for trichinella ; (2) meat infected with *Cysticercus bovis* may be passed after 21 days' pickling, or freezing so that the temperature all through the meat is down to –3°C. for at least 24 hours ; (3) vertebral columns and heads of pigs have to be split in all cases, and (4) examination must be made for *C. ovis* in sheep and goats. The amendments in the law relating to exposure of meat for sale are set forth.—M. F. Benjamin.

van Oijen, C. F. (1937). De keuring van vee en vleesch in Nederland in het tijdvak 1912 tot 1937. [**Meat Inspection in Holland between 1912 and 1937**].—*Tijdschr. Diergeneesk.* **64.** 1173-1182.

A historical review of the development of meat inspection in Holland during the past 25 years. With reference to the part played by the Veterinary Society of Holland the Society strongly supported the proposal to institute a chair for the study of " Human foodstuffs of animal origin " at the Utrecht University (1918). They also urged the passing of the Meat Inspection Act (1919), which has greatly improved the meat hygiene conditions. The author is of the opinion that the management of local meat inspection should always be in the hands of specialized veterinarians and that future meat inspectors, after finishing their veterinary studies, should go through training at a large abattoir.—C. Bubberman (Schiedam).

Schiebe, H. (1937). Ueber Anaërobenbefunde bei der bakteriologischen Fleischuntersuchung. [**Anaerobes in Bacteriological Meat Inspection**].—*Z. InfektKr. Haustiere.* **51.** 99-112. 1 table. [15 refs.]

Shake cultures sown according to a technique laid down are used for the detection of anaerobes in routine bacteriological meat inspection in Germany and S. undertook a series of experiments to determine to what extent cultures so obtained are those of pathogenic anaerobes. 103 cultures, made from the carcasses of animals slaughtered while suffering from various diseases, showed gas formation, 57 of the cultures were pathogenic anaerobes (*Clostridium welchii* 24, *Cl. oedematiens* 29, *Cl. septique* 4) and the remainder staphylococci, *Bact. coli* and non-pathogenic anaerobes. S. cites Saint-Moulin [(1935). *Ann. méd. vét.* **80.** 207-216.] as finding that horse meat imported into Belgium from England, especially in summer or after a prolonged journey, may show marked changes due to *Cl.s.* He states that whatever the organisms, gas production in shake cultures justifies the condemnation of meat.—M. F. Benjamin.

Schönberg, F. (1937). Die Fliesspapierprobe, ein einfaches Hilfsmittel zur Feststellung des Ausblutungs- und Wasserigkeitsgrades in Fleisch, insbesondere bei der Beurteilung von Not- und Krankschlachtungen. [**The Blotting Paper Test for Degree of Bleeding and Oedema in the Flesh of Animals Slaughtered in Emergency**].—*Berl. tierärztl. Wschr.* Aug. 13th. 510-512. 5 figs.

S. inserted special blotting paper strips 1·5 cm. wide and 10 cm. long into incisions in the muscles of slaughtered healthy animals, in such a way that half the strip was covered by the flesh and half projected. After 24 hours the only result was a slight dampness in the surface touching the meat and a yellow colour. A similar experiment was carried out with carcasses of unhealthy animals, and the blotting paper became more or less red and damp all over. He recommends this method of testing to meat inspectors.—M. Burke.

I. Knorr, M., & Lippert, F. (1936). Die Wirkung von Eierkonservierungsmitteln auf künstlich infizierte Hühnereier. [**The Action of Egg Preservation on Artificially Infected Hens' Eggs**].—*Arch. Hyg., Berl.* **115.** 260-267. [9 refs.]

II. Lerche, M. (1936). Enteritis-Bakterien in Enteneiern und Lebensmitteln, die mit Enteneiern hergestellt wurden. [**Salmonella Infection in Duck Eggs**].—*Tierärztl. Rdsch.* **42.** 809-814. 4 tables.

III. Grebe, & Gräning. (1937). Lebensmittelvergiftungen durch Enteneier. [**Food Poisoning from Ducks' Eggs**].—*Dtsch. tierärztl. Wschr.* **45.** 245-247. [6 refs.]

IV. Zwanenburg, T. S. (1937). Ueber "Salmonella-Infektion" von Enteneiern. [**Salmonella Infection in Ducks Eggs**].—*Berl. tierärztl. Wschr.* Sept. 24th. 599-601. 1 fig.

I. Preservation of eggs with lime, waterglass and similar preparations does not destroy salmonella contamination of the outside of the shell with any degree of certainty. If the organisms are protected by even a thin layer of faeces they will resist destruction for long periods.

II. A total of 332 duck eggs were examined culturally and *S. enteritidis* was isolated from the outside of the shell in 16 instances, from the albumen once and from the yolk in two cases. As regards the influence of the contents of eggs upon this organism it was shown that whilst the yolk constitutes a valuable pabulum for its growth the white has a bacteriostatic effect upon it which lasts for about three days after the egg is laid. If faeces contaminated with this organism are left on the outside of egg shells, it may in time penetrate into the interior. When eggs were stored at 18°C. penetration occurred in one experiment after 18 days. Since ordinary egg preservation does not destroy the organism, the problem of disinfecting eggs prior to preservation was studied. Very brief immersion of a few seconds' duration in a hot 5% caustic soda solution, or in boiling water, destroyed all salmonella.

III. A brief review of confirmed outbreaks of salmonella food poisoning in man originating from duck eggs.

IV. Because the blood of so many ducks contains specific antibodies against certain members of the salmonella group known to cause food poisoning in man, an attempt was made to correlate the antibody titre of the blood with the probability of the birds' laying contaminated eggs. It was hoped that it might be possible to adopt a standard antibody titre which would serve to indicate whether a bird should be eliminated as a potential excretor, because the elimination of all birds showing any antibodies at all was deemed impracticable from an economical point of view.

It was found that amongst a group of ducks giving negative agglutinin reactions a small proportion laid infected eggs. Amongst birds having low antibody titres some occasionally laid infected eggs, whereas amongst those having high antibody titres a greater proportion laid infected eggs. These results indicate that to eliminate all carriers of these salmonella infections it would be necessary to carry out not only serological tests, but also frequently repeated cultural examinations of faeces and eggs.—E. J. Pullinger.

Wedemann, W., & Moser, F. (1937). Ueber das Vorkommen von psychrophilen Keimen auf und in Hühnereiern und über die Frage ihres Eindringens in den Eiinhalt wahrend der Kühlhauslagerung. [**Psychrophilic Organisms on and in Hens' Eggs and their Penetration during Cold Storage**].—*Reichgesundheitsblatt.* **12.** 588.

Investigations into the disinfection of cold storage premises were carried out by the authors at the instance of the Reichsgesundheitsamt. Among other things, they concluded that the percentage of eggs spoiled by psychrophilic organisms during cold storage is comparatively small. They recommend that the public should be strongly encouraged to appreciate eggs preserved by cold storage. —M. Burke.

Anon. (1937). **Report of the Special Committee on Food Hygiene.**—*J. Amer. vet. med. Ass.* **91.** 451-458. 2 tables.

A statement of the case that inspection of meat and milk should be under veterinary control.—H. V. Hughes.

I. Robinson, E. M. (1937). **Food Poisoning Caused by Materials of Animal Origin.**—*S. Afr. med. J.* **11.** 455-463. [Numerous refs.]

II. Steyn, D. G. (1937). **Food Poisoning Caused by Substances other than those Produced by Bacterial Infections.**—*Ibid.* 463-466.

I. This article is a review one and reference is made to a number of the more recent publications on the subject. Under foods inherently " poisonous ", mention is made of salmon " poisoning " in dogs in Oregon, due to eating fish infested with the intermediate stage of the salmon fluke *Nanophyetus salminicola*. The greater part of the article is devoted to the part played by *Salmonella* organisms in producing food poisoning. The numerous outbreaks of food poisoning due to infection of food materials with staphylococci are mentioned. In conclusion a discussion of the subject of poisoning by shell-fish, cheese, eggs, etc., is given. [At the time the article was written the work of Meyer and co-workers in California on shell-fish poisoning due to a plankton infection had not been published so could not be reviewed].

II. This article is divided into several sections dealing with different aspects of the subject. In discussing the minerals, mention is made of the possibility of chronic poisoning from eating foods cooked in aluminium utensils. Reference is made to the so-called " bread poisoning " due to flour made from wheat which had been contaminated with portions of poisonous species of *Senecio* (*S. ilicifolius*). Poisoning due to toxic substances normally present in food and drink is dealt with, and the possible dangers of preservatives in food are discussed. Mention is made of the effect of the sun's rays in producing toxic substances in fruit and vegetables and the dangers attached to honey prepared from the nectar of flowers of poisonous plants.—E. M. Robinson.

THERAPEUTICS.

I. King, H., Lourie, E. M., & Yorke, W. (1937). **New Trypanocidal Substances.**—*Lancet.* **233.** 1360-1363. 9 tables. [4 refs.]

II. Anon. (1937). **New Trypanocidal Substances.**—*Ibid.* 1381-1382.

I. Following the finding that synthalin has a direct trypanocidal action, a number of guanidines, isothioureas, amidines and amines with alkyl and alkylene chains were prepared and examined for trypanocidal activity. Certain diamidines exhibit a powerful trypanocidal action *in vitro*, and the most active member of the series, undecane diamidine, can produce permanent cures in injected laboratory animals. This substance is of entirely different chemical constitution from all known trypanocidal substances. Resistance to the drug is acquired by the trypano-

somes very slowly, if at all, and trypanosomes which have been made completely resistant to the aromatic arsenicals and to Bayer 205 exhibited no resistance to this compound. These results open up a new field in the search for substances of therapeutic value against trypanosome infections.

II. An annotation of I.—J. M. Robson.

Kingscote, A. A. (1935). **Preliminary Report upon the Use of Azamine (Tolylazodiamino-Pyridine-Hydrochloride) for the Treatment of Coccidiosis.** —*Rep. Ont. Vet. Coll., 1934.* pp. 49-50. [2 refs.]

Azamine, in doses of 0·025 g., did not inhibit development of *Eimeria tenella* or *E. mitis* (experimental infection) in young chickens which, however, did not develop clinical symptoms of the disease, as did the controls. An experiment with the drug in mink suffering from coccidiosis (natural infection) gave inconclusive, but apparently encouraging results.—E. A. Watson.

Finklestone-Sayliss, H., Paine, C. G., & Patrick, L. B. (1937). **The Bacteriostatic Action of *p*-Aminobenzenesulphonamide upon Haemolytic Streptococci.**—*Lancet.* **233.** 792-795. 2 figs., 4 tables. [7 refs.]

The bacteriostatic action of sulphanilamide upon haemolytic streptococci is preceded by a phase of growth stimulation, which is more conspicuous in young cultures than in those which have passed through the logarithmic phase of growth. Sulphanilamide is more soluble in the fatty envelope which can be separated from haemolytic streptococci than in aqueous solution. The drug does not appear to modify the activities of polymorphonuclear leucocytes. It stimulates the phagocytic activity of reticulo-endothelial cells, and the production of polymorphonuclear leucocytes by the bone-marrow in rabbits.—J. M. Robson.

Graham, R., & Brandly, C. A. (1937). **Studies on Incubator Hygiene. IX. The Disinfecting Properties of Formaldehyde for Hemophilic Bacteria Associated with Avian Coryza, the Filtrable Viruses of Infectious Laryngotracheitis and Infectious Bronchitis.**—*Poult. Sci.* **16.** 428-433. 4 tables. [6 refs.] [See also *V. B.* **7.** 451].

Experiments were carried out by exposing the various infections on squares of cotton to the action of formaldehyde in a forced draught incubator. Formaldehyde was released from cheese cloth at the rate of $16\frac{2}{3}$ c.c. per 100 cubic feet.

The results show that two separate cultures of haemophilic bacteria and the dried virus of infectious bronchitis were constantly destroyed after 60 minutes exposure, but were usually not destroyed at the end of 30 minutes. Virus of laryngotracheitis in moist material was destroyed in 30 minutes, but dried virus resisted fumigation for 90 minutes.—W. J. Ironside.

POISONS AND POISONING.

I. Smyth, H. F., Smyth, H. F., Jr., & Carpenter, C. P. (1936). **The Chronic Toxicity of Carbon Tetrachloride : Animal Exposures and Field Studies.** —*J. Industr. Hyg. Toxicol.* **18.** 277-298. 3 tables. [Numerous refs.]

II. Shaw, J. N. (1937). **Carbon Tetrachloride Poisoning in Sheep.**—*J. Parasit.* **23.** 536.

I. White rats, monkeys and g. pigs were exposed to known concentrations of CCl_4 vapours for definite periods and records were taken of live-weight gains,

fertility, infections, blood counts and of certain blood and urinary constituents. Microscopic examination was made of all animals dying under experiment. G. pigs (like rabbits) were very susceptible to the vapours, although addition of Ca to the diet considerably prolonged their survival times; many g. pigs died from hepatic and renal disturbances before any sign of structural damage was evident. Rats developed a fatty degeneration of the liver and lesions in the kidneys, but after stopping of the exposure regeneration of the damaged tissues occurred followed by an increased resistance to the CCl_4 vapours. Little harm to the monkeys was noticed and any liver and kidney injury disappeared after 28 days' rest.

Examination of workers under industrial conditions of exposure indicated that 100 p.p.m. CCl_4 is a safe concentration and hepatic and renal damage is believed to be followed by regeneration as with animals, leading to increased resistance. Regular physical and chemical examinations of the blood are recommended where workers are exposed to higher concentrations.

II. Unsuccessful efforts were made to disturb the liver function in sheep by such changes in the diet as may occur under natural conditions (except for the addition of alcohol) in an attempt to induce a susceptibility to CCl_4 poisoning. This question of susceptibility continues to be a problem associated with the use of CCl_4 for the eradication of liver fluke.—Alfred Eden.

Clawson, A. B., & Moran, E. A. (1937). **Toxicity of Arrowgrass for Sheep and Remedial Treatment.**—*Tech. Bull. U.S. Dep. Agric.* No. 580. pp. 16. 10 tables. [5 refs.]

In investigation of the toxicity of arrowgrass (*Triglochin maritima*) due to a cyanogenetic glucoside, plants were collected from 11 areas of Utah, growing under a range of conditions from drought to standing water. Green leaves of the plant, being the most toxic parts, were fed in all the experiments. Leaves from plants growing under conditions of drought were much more toxic than those growing with moderate available moisture. Leaves that made their entire growth in standing water were only about 0·1-0·2 times as toxic as those grown in very dry areas. Under the same moisture conditions, the age of the leaves had no effect on their toxicity, and there was no evidence that second growth leaves were more toxic than those of the first growth. Drying leaves in sun or shade did not reduce their toxicity to sheep, although there was a gradual loss of toxicity on storage; there was no evidence of increased toxicity on storage. Some, but not all, of the HCN may be driven off by heating the leaves with steam. Intraperitoneal injections of 1 g. $NaNo_2$ and 2 g. $Na_2S_2O_3$ in 20% aqueous solution may be effective in combating the HCN poisoning, provided that the treatment is given within an hour and that the amount fed does not exceed 1·4 times the lethal dose.—Alfred Eden.

Ewart, R. H. (1937). **Poisoning in Young Cattle by a Member of the Scrophulariaceae.**—*Vet. Rec.* **49.** 1514. [1 ref.]

Young cows developed a sudden illness after the ingestion of *Scrophularia aquatica*, characterized by symptoms of excitement and restlessness, accelerated and short breathing, dilatation of the pupils, hyperaemia of the gums and small ulcers of the mucous membrane, infrequent and painful urination and profuse diarrhoea with passage of dark foetid faeces. There was also thirst and loss of appetite and of milk secretion. Treatment consisted of administration of tannic acid (to precipitate alkaloids) followed by saline purgatives and later by stimulants. The animals recovered completely in two days.—Alfred Eden.

PHYSIOLOGY.

PEGREFFI, G., & DORIA, C. (1937). Sulla composizione chimica, sui caratteri fisici e biologici e sul contenuto citologico del liquido cefalo rachidiano del cane. [**Nature of the Cerebrospinal Fluid of the Dog**].—*Nuova Vet.* **15.** 363-368 and 389-393. 1 fig. [6 refs.]

An examination of samples of cerebrospinal fluid taken from 52 healthy dogs was carried out. The fluid was withdrawn from the subarachnoid space by means of a fine needle inserted just below the external protuberance of the occipital bone. The pressure varied between 20 to 40 cm. of water and after the removal of 5 c.c. of fluid fell to between 10 to 18 cm. of water. The properties were as follows :– the fluid obtained was clear, except in two cases in which it was haemorrhagic ; pH 7·6 ; sp. gr. 1,006 to 1,009 ; depression of freezing point 0·16°C. ; refractive index 2·27 to 1·96. Leucocytes were not always present and never exceeded 2 per c.mm. The average composition per litre was as follows :– albumin 0·16 g., glucose 0·8 g., dry matter 12·11 g. and ash 9·89 g.—J. A. NICHOLSON.

I. VITALI, G. (1937). Alcuni rilievi alla pubblicazione del Prof. Mongiardino " Osservazioni sulle terminazioni nervose nella membrana cheratogena dell'Equus caballus ". [**Comments on Paper by Mongiardino**—*Profilassi.* **10.** 46.—**on the Nerve Endings in the Hoof of the Horse**].—*Profilassi.* **10.** 198-199. [3 refs.]

II. MONGIARDINO, T. (1937). Poche parole su di alcuni rilievi fatti dal Prof. Giovani Vitali al mio lavoro sulle " terminazioni nervose sulla membrana cheratogena dell'Equus caballus ". [**Reply to Comments by Vitali**—*Profilassi.* **10.** 198.—**on my Paper on Nerve Endings in the Hoof of the Horse**].—*Ibid.* 199.

I. A reply to an article by MONGIARDINO [*V. B.* **8.** 254]. V. confirms the presence of Pacinian corpuscles in the sensitive laminae of the horse's foot, but affirms, contrary to M's findings, that there is a fine network of non-myelinated nerve fibres in the interpapillary area which extends into the subpapillary layer. In the superficial part of the solar matrix there is also a non-myelinated network of fibres, whilst both Pacinian and Golgi-Mazzoni corpuscles are present.

II. M. states that he was unaware of V's work, but he cannot confirm the presence of intra-epithelial nerve fibres or of nerve endings in the solar matrix. —J. A. NICHOLSON.

KAY, H. D. (1937). **The Bio-Chemistry of Milk Secretion.**—*J. R. Soc. Arts.* **85.** 841-857. 4 tables.

The paper surveys recent work in connection with the biochemistry of milk secretion, including the factors which influence it and the possibility of their control.

The following factors are suggested as being responsible for the production of low-quality milk (*i.e.*, milk containing less than 3% of fat and 8·5% of solids other than fat :– (1) the unnatural physiological strain of a high milk yield added to the burden of gestation, (b) inflammation of the udder, (c) malnutrition, and (d) drought.

Experiments in connection with the action of hormones on milk secretion are mentioned ; oestrin administered to a lactating cow increased the percentage of fats and non-fatty solids, and thyroxine produced an increase in both quality and quantity with an attendant diminution in the concentration of phosphatase.

In connection with the blood precursors of the milk constituents, milk fat is

said to come from the neutral fat of the blood, and the phosphorus compounds (including part of the casein and the milk phosphoric esters) from the inorganic phosphate of the blood plasma.

The contents of vitamins A and D are increased by feeding on food rich in these vitamins. The loss of the vitamin C content can be controlled by shielding the milk from light.—H. V. Hughes.

Barcroft, J., & Barron, D. H. (1937). **Movements in Mid-Foetal Life in the Sheep Embryo.**—*J. Physiol.* **91.** 329-351. 6 figs. [15 refs.]

In order to test the postulate that if asphyxiation influences behaviour by rendering inactive inhibitory centres operating on the spinal cord and medulla it should be possible to produce similar results by transecting the brain stem cephalad to the medulla, experiments were carried out upon 20 ewes and foetuses. Under ether anaesthesia, and adopting delicate technique (details of which are described), sections were made through the foetal central nervous system in different foetuses from the fourth cervical region to the diencephalon without removing the foetus from the uterus. 11 of the ewes and foetuses survived the operation.

The authors consider that the results appear to support the view that the gradual inhibition of activity occurring in the foetus as gestation proceeds is brought about by fibre systems which descend into the cord. Further degrees of inhibition occurring later are governed by centres lying further forward in the fore brain.

No change was noted in the type of respiration as the result of transecting the central nervous system until the section was above the mid-brain, when the respiratory movements, like movements in other parts of the body, changed from the jerky to the sustained type of movement.—H. V. Hughes.

McKenzie, F. F., & Terrill, Clair E. (1937). **Estrus, Ovulation, and Related Phenomena in the Ewe.**—*Res. Bull. Mo. agric. Exp. Sta.* No. 264. pp. 88. 9 text figs., 22 figs. on 11 plates, 32 tables. [Numerous refs.]

An account is given of the study of the events of the oestral cycle of the ewe, their functions and time relationships, and the factors which influence them. 344 ewes were observed during seven seasons, the mean oestral period being 29·33 hours, and the mean oestral cycle being 16·72 days. Ovulation, noted by means of laparotomy, occurred usually near the end of oestrus. The mean time between each of double or twin ovulations was 1·73 hours. The effects of high and low planes of nutrition were observed, the latter being accompanied by a shorter breeding season, a slightly longer oestrual cycle and lower ovulation rate, and a shorter pre-ovulation period. The duration of oestrus did not vary with differences in the plane of nutrition.

The histological changes in the genital tract during the cycle are described, sections being taken from the various parts of the tract at the different periods. Results of the experimental alteration and induction of oestrus and ovulation are reported.—H. V. Hughes.

Abbot, A. C., & Prendergast, J. (1937). **Histological Variations in Fetal Calves' Thyroids and a Comparison with Maternal Thyroids.**—*Canad. med. Ass. J.* **36.** 228-237. 16 figs., 8 tables. [7 refs.]

This investigation concerns the development and histological variations of the thyroid from the second to the ninth month of intra-uterine life. The findings are in each case tabulated, classified and compared with the maternal thyroid. Colloid, vesicle formation and vacuolation were found as early as the second month,

hyperplasia in the fourth month and differentiation almost complete by the end of the sixth month of intra-uterine life. For the first seven months there were no histological similarities of the maternal and foetal thyroids, but in the last months of pregnancy the similarity was striking.—E. A. Watson.

Trautmann, A. (1937). Die Wirkung des Zirbeldrüsenpräparates " Epiphysan " auf die germinalen und akzidentellen Geschlechtsmerkmale juveniler Tiere. [**Action of Pineal Body Extract on Young Animals**].—*Dtsch. tierärztl. Wschr.* **45.** 669-671. 2 figs. [7 refs.]

Chicks were fed and injected with " epiphysan ". The growth of the comb, and the growth and development of the testes were inhibited. The data published are insufficient to determine whether the results have any significance.—J. M. R.

MISCELLANEOUS.

Stewart, J. L. (1937). **The Cattle of the Gold Coast.**—*Vet. Rec.* **49.** 1289-1297. 6 figs. [Numerous refs.]

The modern cattle of the Gold Coast, which S. terms West African Shorthorn, are largely a mixture of three basic breeds—the Hamitic Longhorn (the descendant of the African urus), the Brachyceros (the dwarf Shorthorn), and zebu cattle (derived from the Asiatic urus). The degree of admixture of these three breeds is determined by environment and by protozoal disease, especially trypanosomiasis. Research suggests that the Hamitic Longhorn possesses a breed resistance to protozoa generally, but that the West African Shorthorn cattle generally possess a resistance to local strains of protozoa which may break down when the cattle are moved to a new habitat.

There are nearly 200,000 cattle in the Gold Coast, the number having been doubled in five years, and there is a great demand for meat. The aim of the authorities is to increase the weight of the bullock from 4 or 5 to 7 hundredweight. Success is resulting from the crossing of N'Dama (Hamitic Longhorn) bulls with Sudanese and White Fulani zebu cows.—H. V. Hughes.

Waldo, S. G. (1937). Quattordici mesi in African Orientale. (Giugno 1935—Luglio 1936). [**Fourteen Months in East Africa**].—*Clin. vet., Milano.* **60.** 2-8. 2 figs.

It is estimated that there are 20 million animals, chiefly cattle and goats, in Abyssinia. As a result of prolonged inbreeding, much of the stock is of inferior quality, so that there is need for the introduction of approved sires and castration should be practised on a large scale. The natives, however, are extremely conservative and are not inclined to change their methods. Owing to the uncertainty of the rains, feeding will always present certain difficulties ; in any case the pastures have not a high nutritive value.—J. A. Nicholson.

I. Anon. (1937). **Report of the Committee on Education.** [**A.V.M.A.**]—*J. Amer. vet. med. Ass.* **91.** 441-443.

II. Anon. (1937). **Report of the Committee on Policy.** [**A.V.M.A.**]—*Ibid.* 427-431.

III. Anon. (1937). **Report of the Committee on Resolutions.** [**A.V.M.A.**]—*Ibid.* 468-496.

I. 2,501 students were enrolled in veterinary colleges during the past year, this number being 29 less than the total for 1935-36. The number of students

who graduate each year is insufficient. The transfer of students from one college to another is now being stopped except where adequate reasons are given. There is apparently no standard curriculum, but marked progress is being made by colleges.

II. By articles and publicity work the attitude of the masses towards veterinary surgeons has been favourably changed. The committee recommend that colleges should be enlarged and improved and that the laws relating to veterinary practice should be strengthened. An important aspect of the control of imported frozen meat is the danger of infection with foot and mouth disease.

III. Seven resolutions were considered. Private poultry disease schools were condemned and it was resolved that a suitable personnel be appointed to supervise the pullorum disease phase of the Poultry Improvement Plan. Trichinosis control should be expedited. The Pure Food and Drug Administration should make rules to control the claims made for biological products that are not in keeping with scientific knowledge.—R. FISHER.

MERICLE, R. B. (1937). **Activities of the Bureau of Agricultural Economics in the Inspection of Poultry and Poultry Products that are of Interest to the Veterinary Profession.**—*J. Amer. vet. med. Ass.* **91.** 651-655.

This paper gives a brief history of the growth of dressed poultry inspection in the U.S.A. Inspections are carried out by qualified veterinary surgeons for the Bureau of Agricultural Economics according to federal specifications. The equipment used is described and the costs of inspection are discussed. It is interesting to note that in 1936, 33 million pounds of dressed poultry were government inspected and 700 thousand pounds were condemned. The most common disease was tuberculosis, other conditions mentioned being, septicaemia, emaciation, peritonitis, tumours, leucaemia and abscesses.—J. C. WALLACE.

SCHMALTZ. (1937). Der erste Deutsche Tierärztetag. [**The First German Veterinary Congress—in the Third Reich, June, 1937**].—*Dtsch. Tierärztebl.* **4.** 277-279.

S. describes the Congress as a celebration of the great progress and improved status of the German veterinary profession under the Third Reich. This followed particularly from :– (a) the Order (Reichstierärzteordnung) of April, 1936, which assigned to the profession not only the care of animal health, but also a share in the public health service, and (b) the creation of an independent veterinary department (Veterinärabteilung) of the Ministry of the Interior, Dr. Weber, Leader of the Veterinary Profession [Reichtierärzteführer], becoming " Ministerialdirektor ". At the same time S. criticizes as a backward step the merging of the Berliner tierärztliche Hochschule into a Veterinary and Agricultural Faculty (landwirtschaftliche-tierarztliche Fakultät) of the University. The formal proceedings of the two-day Congress are described.—D. H. WILLSON.

PROSCHOLDT, O. (1937). 20. Dienstversammlung der Direktoren der Tiergesundheitsämter der Landesbauernschaften am 18./19 August 1936 in Königsberg i. Pr. [**20th Meeting of the Directors of Animal Health Offices, at Königsberg, August, 1936**].—*Berl. tierärztl. Wschr.* March 26th. 198-201, 216-218, 230-232 and 246-248. [Numerous refs.]

The meeting was attended by 27 Directors, who presented and discussed papers on bovine tuberculosis, bovine brucellosis, streptococcal mastitis, sterility and various other conditions. The papers were published in full elsewhere in this *Bulletin*, but are given in condensed form in the above periodical.—J. E.

KRAGE. (1937). Das neue Tiergesundheitsamt der Landesbauernschaft Ostpreussen. [**The New Animal Health Office of East Prussia, Königsberg**].—*Berl. tierärztl. Wschr.* Sept. 3rd. 558-559. 1 photograph. [1 ref.]

This institution has been in existence for 30 years and a fine new building has just been completed for it. The work done in it is organized in four sections :– general diagnosis, tuberculosis, abortion and sterility in mares and cattle, and serum preparation.—J. E.

BACKHAUS, J., & WIENDIECK, K. (1937). Vorschriften für die Veterinärverwaltung im Deutschen Reich nebst den Sondervorschriften für Preussen. Band I u. II (umfassend den Zeitraum vom 1. April 1935 bis Ende 1936). Band III (1937). [**Administrative Veterinary Instructions, Germany. Vols. I, II and III, 1935-1937**]. pp. 320 and 248. Berlin : Richard Schoetz. [8vo].

This is a new periodical publication containing all the government acts, orders and decrees, which concern veterinary work of every kind in Germany, both of a public and private nature, the matter being arranged under the following headings :– general administration, education, private and political organization, animal disease control, the milk law, meat inspection, etc., animal breeding and protection, shoeing, dispensing and quackery. It appears quarterly.—J. E.

GERMANY. (1937). Deutsches Reich. Runderlass des Reichs- und Preussischen Ministers des Innern, betr. Jahresveterinärberichte. [**Regulations for the Standardization of Annual Veterinary Reports**].—*Reichsgesundheitsblatt.* **12.** 722-723.

From 1938 onwards the reports of state veterinarians in Germany are to be standardized : the scheme outline which applies to all veterinary activities is given. The main framework is as follows :–

Part I. (A) notifiable diseases, (B) non-notifiable diseases, (C) parasitic diseases, (D) poisoning, and (E) nutritional diseases.

Part II. (A) general veterinary work, including veterinary police, market inspection, dairy inspection, animal breeding, shoeing and clinical work, and (B) public health services, including meat and milk inspection.—J. E.

LÜTHGE, H. (1937). Die Stellung des Tierarztes in der neuen Reichsprüfungsordnung für staatlich anerkannte Tierzuchtleiter vom 21. Juli 1937. [**The Place of the Veterinarian in the New Reich Examinations Order for State-Recognized Animal Breeding Organizers of July, 1937**].—*Dtsch. Tierärztebl.* **4.** 337-339.

Co-operation between the veterinary profession and State Animal Breeding Organizers was laid down as a principle in the State Animal Breeding Law (Reichstierzuchtgesetz) of March, 1936. The qualifications necessary for admission to the state examination for the special qualification of " Organizer in Animal Breeding ", and the subjects of the examination itself, are given in detail. Admission to the examination is in some ways made easier and quicker for the qualified veterinarian than for laymen : the veterinarian may acquire his training in any of several different animal breeding schools or institutes, and may take a special shortened form of the practical course required. The examination committee, nominated by the Minister of Food and Agriculture, must include one or more veterinarians, appointed by agreement with the Minister of the Interior.

—D. H. WILLSON.

I. ANON. (1937). Il raduno dei veterinari sardi a Cagliari. [**Meeting of Sardinian Veterinarians at Cagliari**].—*Azione vet.* **6.** 814-818.

II. Anon. (1937). Congegno dei veterinari della provincia di Modena. [**Meeting of Veterinarians of Modena**].—*Ibid.* 819-823.

I. An unnamed lecturer emphasized the necessity of enforcing regulations respecting notification of infectious diseases, and prevention of the practice in remote districts of leaving the bodies of animals that have died of such diseases to be devoured by dogs and birds. He passed in review tumours, bovine tuberculosis, brucellosis, swine fever, parasitic diseases (chiefly in fowls) and various other diseases as noted in the island.

II. Prof. Gerosa lectured on sterility in cattle and Prof. De Paoli on control of foot and mouth disease, anthrax and the danger of infection of human beings, and on infectious diseases of swine.—S. F. J. Hodgman.

Anon. (1937). A magyar állatorvosi szakoktatás megindulásának. 150. évfordulója. 1787-1937. [**The 150th Aniversary of Veterinary Training in Hungary**]. —*Állatorv. Lapok.* **60.** 107-124. 5 photographs. [2 refs.]

In 1786 a veterinary hospital was founded at Budapest, being attached to the Faculty of Medicine of the University. At first lectures were given to medical students on infectious diseases of animals, but in 1799 a separate one-year veterinary course was founded for students of the Medical Faculty. In 1851 the veterinary hospital was separated from the Medical Faculty, and the course was extended to three years. In 1870 the teaching body consisted of six professors, six assistants and one prosector, and in 1875 the Veterinary Faculty was recognized as an academy and was reorganized in 1890. In 1899 the academy became an autonomous Veterinary High School, and in 1906 it acquired the right to confer veterinary doctorates. In 1923 the Director of the Veterinary High School was given the title of " Rector Magnificus ", and in the next year the curriculum was extended to nine semesters [4½ years]. In 1934 the Veterinary High School was merged as a veterinary department in the Palatin Josef University for Technical Sciences. —Z. de Csukás (Magyaróvár).

Rodier, E. A. (1937). **Organizing a Bureau of Animal Welfare for Kwangsi Province, Southwest China.**—*J. Amer. vet. med. Ass.* **91.** 294-309. 7 figs.

R. describes the pioneer task of establishing a modern system of animal disease control and animal improvement in a land mainly agricultural, whose great poverty is said to be largely due to the loss of domestic animals through disease. A Bureau headquarters built and equipped according to modern ideas, with a laboratory and a school for training Chinese veterinarians, was set up—the courses covering tuition for varying periods up to a maximum of three years, and disease control work was demonstrated in a " model county ", to obtain further grants of money for the work from the Kwangsi government.

Disease control consisted mainly of the large-scale production and use of rinderpest vaccine. Breeding was improved by the formation of livestock breeding clubs, and the feeding of stock by the importation of grasses and better ploughing methods. The help of the government was secured for a propaganda campaign, and suitable legislation was introduced.—D. H. Willson.

OFFICIAL AND OTHER REPORTS.

Canada, Ontario. (1935). **Report of the Ontario Veterinary College, 1934.** [McGilvray, C. D.] pp. 69. 31 figs., 5 tables. [16 refs.] Toronto: T. E. Bowman. [8vo].

Student enrolment has increased and the College is operating to full capacity.

Regular and special courses of study are outlined and details given of the various animal clinics, diagnostic services and specimen examinations. The report contains a number of special articles dealing with research and investigational projects which are dealt with separately in this *Bulletin*.—E. A. Watson.

Canada, Ontario. (1936). [**Report of Work on**] **Pathology and Bacteriology [at Ontario Research Foundation, 1935]**. [Hadwen, Gwatkin, & Fallis]. —*Rep. Ont. Res. Fdn., 1935*. pp. 16-18.

A short summary is given of work done towards accumulating data on which estimates of the extent of mastitis in Ontario herds, and of the losses due to it, can be based. Clinical data were correlated with laboratory findings in a study of 316 cows. In these clear evidence of mastitis was obtained in 139 or 44% and suspicious indications in 29 or 9·1%. They include 93 cases of mastitis due to streptococci, 33 cases due to staphylococci and one due to *Corynebacterium pyogenes*.

Regarding diagnosis, it is assumed that the microscopic study detects all cases, then that cultural methods failed to diagnose 8·4% of the cases, bromthymol blue and rennet failed in 29·5%, and clinical examination failed to detect 21·7%. Five cows with clinical symptoms showed no indication of mastitis by other methods of diagnosis.—E. A. Watson.

Union of South Africa, City of Johannesburg. (1938). **Report of Director of Abattoir, Live Stock Markets, Veterinary Services, Ice and Cold Storage Department for the Period 1st July, 1936, to 30th June, 1937.** [Irvine-Smith, J.] pp. 36. 8 tables, 6 appendixes. Johannesburg: Radford, Adlington, Ltd. [fcp].

This report affords a detailed description of the working of the abattoir, livestock market and various other services in connexion therewith. 141,244 cattle, 18,610 calves, 128,121 pigs and 514,489 sheep, lambs, and goats were slaughtered during the year. 1,346,820 animals passed through the livestock market. The total amount of meat and offal seized and condemned in the abattoir was 848 tons. There is an insurance fund for protection of owners against loss from condemnation after slaughter. A voluntary scheme for grading beef is in operation. Other services include care and treatment of municipal animals, treatment of sick animals at the zoological gardens, cold storage, educational facilities, etc.—S. J. Gilbert.

Uganda Protectorate. (1937). **Annual Report of the Veterinary Department for the Year ended 31st December, 1936.** [Poulton, W. F.] pp. 35. 11 tables, 1 graph, 3 maps, 1 appendix. [5 refs.] Entebbe: Govt. Printer. [8vo] [Shs. 2/-].

Disease Control.—Details are given of an extensive campaign against Rinderpest waged in circumstances of great difficulty owing to staff sickness; the disease was under control by September, but movement of infected game (buffalo) caused outbreaks later. Mortality following inoculation in 10·6% of adult stock and 24·3% of calves was considered satisfactory. Two tables show the number of outbreaks and the number and distribution of inoculations and vaccinations.

Karamoja is the only known area infected with Contagious Bovine Pleuro-Pneumonia which is controlled by strict quarantine. Trypanosomiasis is widespread, except in the Eastern Province and Lango District.

" Experiments on the use of Surfen ' C ' were carried out on two herds of twenty-five head suffering from a mixed infection.

" The result was that *T. vivax* and *T. congolense* were eliminated from the peripheral blood, but individual animals still showed infection with *T. brucei* and a large type of trypanosome resembling *T. theileri*."

The risk of ANTHRAX affecting man and stock in the northern parts of Buddu, in the Mawogola, Masaka district, and in the Ankole is a serious problem. Sporadic cases occur throughout the Protectorate. BLACKLEG does not cause serious losses, but occurs throughout the area.

EAST COAST FEVER, REDWATER and ANAPLASMOSIS continue to cause considerable losses amongst calves. FOOT AND MOUTH DISEASE, not formerly of importance, will have to be considered in future. TUBERCULOSIS research was curtailed. The incidence of this disease in bovines at abattoirs varied from 30% in Ankole stock to 0·2% in zebu stock. Four cases of RABIES in dogs were diagnosed ; no human cases were reported.

GLOSSINA INVESTIGATIONS AND RECLAMATION.—Owing to the RINDERPEST situation work was almost entirely confined to the south Ankole area.

The report concludes with sections dealing with other aspects of animal industry.—J. C. WALLACE.

UGANDA PROTECTORATE. (1937). **Annual Report of the Senior Veterinary Research Officer, Entebbe, for 1936.** [METTAM, R. W. M.]—*Rep. vet. Dep. Uganda*, 1936. pp. 27-34. 1 table. [5 refs.]

Laboratory products issued were as follows :– RINDERPEST serum 6,610 litres, RINDERPEST vaccine 154,890 c.c. and FOWL TYPHOID vaccine 925 c.c. The total routine examinations numbered 28,417.

Research work on RINDERPEST was curtailed owing to the serious position making it necessary for the entire staff to concentrate on serum production. A modification of Bennett's glycerinized spleen and lymph node vaccine was evolved and gave excellent results in preliminary trials ; immunity was established ten days after vaccination and still persisted four months later. Research indicated that RINDERPEST could be transmitted to susceptible bovines by contact with game (kob and waterbuck). One of the bovines so infected developed lesions, but showed no thermal reaction and later was immune. Experiments showed that a dose of 100 c.c. of serum did not give protection against virus given 21 days later, and that a " blocked out reaction " may be followed by a solid immunity ; 25 c.c. per 100 lb. body weight was the dose used and the second dose of virus was given at 28 days.

Research on the susceptibility of domestic ruminants to polymorphic trypanosomes was continued. A report is given of a dog in which *Trypanosoma vivax* was demonstrated ; this is the first time the organism has been seen in dogs in Uganda. The dog became infected by *Glossina palpalis* or *G. morsitans*, which exist in the " fly " belt in the north west extremity of the Ruwenzori massif. Two doses of Bayer 205 were given at an interval of three days ; the dog was then sent to the laboratory, where it died two days later. *Tryp. vivax* and *Tryp. congolense* were found in the blood before death. No polymorphic trypanosomes were found and no eye lesions observed and so it is probable that *Tryp. brucei* was not present. Blood obtained before death produced *congolense* infection in a dog and calf, the former died in 19 days and the latter in 59 days after infection. *Tryp. vivax* infection was not transmitted.

Investigations on the relationship between EAST COAST FEVER and TURNING SICKNESS were continued. Ticks from an acute and a chronic case of the latter disease transmitted E.C.F. to calves. The chronic case, although blind, did not

show turning movements or clinical symptoms of E.C.F.; of interest parasitologically is the fact that schizonts are found in small numbers in lymph node smears. Research on the morphology of *Theileria parva* and the nature and duration of the immunity that follows recovery in most cases of E.C.F. has been carried out.

A case of naturally contracted TUBERCULOSIS in a goat is mentioned; the animal was in excellent condition despite extensive lesions found P.M. It had been kept in a paddock used by rinderpest-reacting cattle.

Feeding tests with poisonous plants were continued and the following plants produced fatal symptoms in rabbits :– *Astrochlaena malvacea*, *Striga asiatica* and *Cissus* species.

RABIES was diagnosed in material received from three cases in the West Nile district.—J. C. WALLACE.

CEYLON. (1937). **Report of the Government Veterinary Surgeon for 1936.** [CRAWFORD, M.] pp. 16. Colombo: Ceylon Govt. Press. [8vo].

During the year the Veterinary Department has been absorbed into the Department of Agriculture, the Chief Veterinary Officer becoming Deputy Director (Animal Husbandry).

INFECTIOUS DISEASES.—There were 39 cases of ANTHRAX and of these 27 occurred in the Colombo quarantine in goats imported from India. Only two cases of BOVINE TUBERCULOSIS were observed. Eighteen cases of HAEMORRHAGIC SEPTICAEMIA occurred. One case of SURRA was diagnosed in a dog which recovered after treatment with naganol. No cases of RINDERPEST were reported. There were outbreaks of FOOT AND MOUTH DISEASE in all parts of the Island, and although they were mild in indigenous and Indian breeds, dairy cattle of European breeds were severely affected, especially as to the after effects. 253 brains were examined by the Pasteur Institute and found positive for RABIES. Destruction of stray dogs is being vigorously pursued.

In poultry " PSEUDO-FOWL PLAGUE " occurred to some extent and an outbreak of a disease characterized by paralysis of the legs was observed; it could not be conveyed by contact or blood injection. Further cases of nasal SCHISTOSOMIASIS occurred in areas previously known to be infected. The need is stressed for a properly equipped veterinary laboratory to undertake research. 522 specimens received laboratory examination.

ANIMAL HUSBANDRY.—An account is given of the work done.—S. J. GILBERT.

CYPRUS. (1937). **Annual Report of the Veterinary Service for the Year 1936.** [ROE, R. J.] pp. 11. 4 tables. Nicosia: Govt. Printer. [fcp].

STAFF.—There were one chief veterinary officer, one veterinary officer, one veterinary inspector, ten stock inspectors, and five others.

EXPENDITURE.—The allotment for the year exclusive of salaries and travelling allowances was £1,400 as compared with £2,400 in 1935. The latter was an unusually high figure on account of the importation of anthrax vaccine from South Africa.

CENSUS.—There was an increase in the numbers of all classes of stock, except camels, which decreased from 921 to 777, since the previous census year. Horses increased from 4,169 in 1934 to 4,532; mules from 8,079 to 8,568; donkeys from 51,301 to 53,888; cattle increased from 36,618 to 38,447; goats since 1935 from 225,925 to 266, 478; sheep from 275,486 to 310,486 and swine from 38,121 to 43,363.

Animal Diseases.—The most serious enzootic disease in Cyprus is Anthrax. This is controlled by annual vaccination of stock, chiefly sheep and goats, between April and June, *i.e.*, after the normal lambing and kidding season, and before the normal " Anthrax season ". The vaccine used is a single spore vaccine prepared in the Cyprus Veterinary Laboratory according to the Onderstepoort method. Estimated losses from Anthrax were reduced from £20,000 prior to the commencement of vaccination to £600 in 1936. " Parasites, helminth and arthropod, now cause greater losses in livestock and animal products than do bacterial, virus and other affections which are coming under satisfactory control ". Parasitic gastritis is common, also liver fluke. Amongst arthropod parasites are mentioned lice (biting and sucking), ticks, keds, warbles, and the sheep nostril fly. Increased interest in dipping is being manifested by villagers.

Routine Diagnosis.—A comprehensive list of laboratory findings, including the classification of parasites, is attached to the report; this is a valuable and informative list.—R. N. Fiennes.

British Guiana. (1938). **Report on the Veterinary Division for 1936.** [Bone, T.]—*Rep. Dep. Sci. Agric. Brit. Guiana, 1936.* pp. 99-100. 1 table.

A few carcasses and parts of carcasses infected with Tuberculosis were condemned at Berbice abattoir. Infectious Vaginitis caused breeding difficulties on the Demerara River. Kidney worm is common in pigs in Berbice.

The introduction of Hereford blood has shown that great improvement can be effected in slaughter cattle. Overstocking is reflected in the poor condition of creole slaughter cattle. Progress in the improvement of dairy cattle is slow, but Holstein-creole crosses have shown good results. Some account is given of breeding operations undertaken.—S. J. Gilbert.

I. Colony of the Gambia. (1934). **The Report of the Department of Agriculture, for the period 1st April, 1933 to 31st May, 1934.** pp. 6. 1 table. Bathurst: Govt. Printer. [fcp] [2s.]

II. Colony of the Gambia. (1935). **The Report of the Department of Agriculture, for the Period Ending 31st May, 1935.** pp. 16. 6 tables, 1 appendix. Bathurst: Govt. Printer. [fcp] [2s.]

III. Colony of the Gambia. (1936). **The Report of the Department of Agriculture, for the Period Ending 31st May, 1936.** pp. 14. 7 tables. Bathurst: Govt. Printer. [fcp] [2s.]

I. A veterinary officer with assistants came from Nigeria to carry out the immunization of cattle against Rinderpest, work being begun in McCarthy Island Province.

II. The above work continued, but no details of the number of animals immunized is given.

III. 1,800 cattle were immunized. It is stated that the results were impressive and that cattle owners are becoming actively interested.—J. E.

Colony of the Gambia. (1937). [**Report on**] **Livestock** [**Diseases, 1936-37**].—*Rep. Dep. Agric. Gambia, 1937.* pp. 3-5.

Mr. G. N. Hall of the Nigeria Veterinary Service was present in the colony from November, 1936 to May, 1937.

Rinderpest has caused much loss in the Colony. 111,000 cattle were actively immunized.—R. N. Fiennes.

Extracts from Annual Reports of Agricultural Experiment Stations U.S.A. [When papers by the staffs of these stations are published abstracts are prepared from them and included in the *Veterinary Bulletin* as a matter of routine].

Arizona, 1935-1936. Investigations were carried out on Actinomycosis, sheep parasites, deaths of sheep on irrigated farms, tumours of the eye and plant poisoning.

Connecticut, Storrs, 1935-1936. The report deals with serological classification of mastitis streptococci, Bovine Brucellosis control, Paratyphoid Infection in fowls, respiratory diseases of fowls, Fowl Paralysis, and sheep diseases.

Idaho, 1936. Notes are given on sheep nostril fly and overshot and undershot jaws in sheep. Work was done on pathology of Bovine Mastitis, eradication methods for *Salmonella pullorum* infection, Paratyphoid (*S. typhi-murium*) in turkeys, " foul sheath " in sheep, and artificial insemination of sheep (the average oestral cycle of Lincoln ewes was 16·5 days and the average duration of oestrus 34·85 hours).

Illinois, 1935-1936. The following animal diseases of importance in the State are discussed :– Johne's Disease (an experimental infected herd is kept), *S.p.* infection, Bovine Brucellosis (58 accredited herds), Swine Fever (attempts are being made to breed resistant strains of pigs), avian virus diseases and virus cultivation on eggs, horse parasites, poultry mortality, Nutritional Anaemia and Cornstalk Disease of horses [disease clinically resembling virus encephalomyelitis, but of unknown aetiology and considered to be related to grazing on mouldy "corn" (maize)], a résumé of bacteriological research being given.

Iowa, 1934-1935. Research projects under investigation included breeding for resistance to Fowl Typhoid and for Paratyphoid in mice, and the pathology of fluorine poisoning.

Kansas, 1934-1936. The results of two years' work on the following are given briefly :– Bovine Brucellosis, Blackleg, Anaplasmosis, Equine Encephalomyelitis, Infectious Enteritis of cats, helminth parasites, comparative resistance of breeds of fowls to parasitism by *Ascaridia lineata*, a Dermatitis of cattle, bovine sterility, various poultry diseases, nutritional disorders of cattle, and selenium poisoning.

Kentucky, 1936. Strains of *Salmonella* from birds were studied by sugar fermentation tests ; *S. aertrycke* [*typhi-murium*] var. *storrs* was isolated from pigeons, *S. newport* from cattle, *S. senftenberg* from turkeys and *S. oranienburg* from quail ; a new type of abortion in mares caused by a filtrable virus was studied. Work was also carried out on sterility in cattle, milk fever and grass tetany.

Massachusetts, 1936. Work was done on *S.p.* infection, including eradication. Antigen selection, the agglutination test, maltose fermentation, viability and infection of turkeys were studied. The organism lived for 4½ years on dry cloth.

Missouri, 1935-1936. Work on Bovine Brucellosis comprised research on blood and milk aggl. titres in an experimental herd and tests with slow and rapid aggl. methods. That on Porcine Brucellosis, concerned the significance of low titre aggl. reactions and the transmission of infection to cattle. Tapeworms in sheep were also studied.

New Hampshire, 1936. The report deals with isolation and cultural behaviour of haemolytic streptococci from pasteurized milk, vaccination against Bovine Brucellosis, eradication of *S.p.* infection and Coccidiosis, and " epidemic tremor " in chicks.

Rhode Island, 1936. Mention is made of Fowl Coryza, Infectious Fowl Bronchitis, Fowl Leucosis, and cerebral disorder of chicks.—J. E.

GERMANY. (1937). Tierärztlicher Bericht für Wurttemberg. Zussammenfassend die Jahrgänge 1933 und 1934. **[Veterinary Report for Wurttemberg for 1933 and 1934].** [FRAAS]. pp. 51. 7 tables. Stuttgart: Bareiss & Cöhne. [4to].

The report deals with all aspects of veterinary work in the province, but some important information is lacking through the omission of tabular data referred to in the text.

ADMINISTRATION.—Ministerialdirektor VON OSTERTAG retired in May, 1933, and was succeeded as chief veterinary officer by Ministerialrat Dr. FRAAS.

PROVINCIAL VETERINARY DIAGNOSTIC OFFICE.—With a staff of five veterinarians general diagnostic work was carried out and biological products against SWINE ERYSIPELAS and bovine brucellosis were prepared.

NOTIFIABLE DISEASES.—Those not present during the period included GLANDERS, HAEMORRHAGIC SEPTICAEMIA, DOURINE, RINDERPEST, CONTAGIOUS BOVINE PLEURO-PNEUMONIA, RABIES, FOWL PLAGUE, and SHEEP POX. Notifiable diseases observed included ANTHRAX, BOVINE TUBERCULOSIS, SWINE ERYSIPELAS, FOWL CHOLERA, BLACKLEG, FOOT AND MOUTH DISEASE, EQUINE INFECTIOUS ANAEMIA, BORNA DISEASE, GENITAL VESICULAR EXANTHEMA, SWINE FEVER and SWINE PLAGUE, equine and bovine MANGE, and SHEEP SCAB. Their incidence and control are discussed.

Notes are also given on non-notifiable diseases, animal health and breeding, and food inspection.—J. E.

HOLLAND. (1936). Verslag over de werkzaamheden van het staatsveeartsenijkundig ondersoekingsinstitut 1935. **[Report of the Veterinary Research Institute, Holland, for 1935].** [FRENKEL, H. S.] pp. 62. 3 figs. on 2 plates, 9 tables. [9 refs.] 's-Gravenhage: Algemeene Landsdrukkerij. [8vo] [F.1]. [English, French and German summaries]. [See also *V. B.* **5.** 866].

The institute dealt almost exclusively with FOOT AND MOUTH DISEASE. This, the second report, consists of papers that have been published elsewhere. [For abstracts of individual articles see *V. B.* **8.** 151].—J. E.

PORTUGAL. (1936). Nota estatistíca dos serviços do Laboratório de Patologia Veterinária nos anos de 1932 a 1935. **[Statistical Report of the Services of the Veterinary Pathological Laboratory, Lisbon 1932-35].**—*Repos. Lab. Pat. vet., Lisboa.* **3.** 145-154. Numerous tables.

Tables are given showing the number of cases of specific bacterial infections, parasites, etc., found in diagnostic work during the four years. The amounts of biological products prepared are also given.—J. E.

MADAGASCAR. (1936). Rapport Annuel de l'Institut Pasteur de Tananarive, Année 1935. **[Report of the Pasteur Institute, Tananarivo, for 1935].** [GIRARD, G.] pp. 41. 9 tables. Tananarive: Imprimerie Officielle. [8vo].

This report chiefly describes work of medical interest, but includes a veterinary and other sections. 684 examinations were made by the veterinary service, including 143 bacteriological examinations of milk. ANTHRAX was diagnosed on 41 occasions in cattle and six times in horses and mules and more than two million doses of vaccine were issued. This was chiefly a spore vaccine and was very successful, but some severe reactions and even deaths occurred in army horses and mules. TUBERCULOSIS in cattle and pigs frequently received laboratory investigation. PIROPLASMOSIS, ANAPLASMOSIS and THEILERIASIS were encountered in cattle and one case of BABESIELLA in sheep.—S. J. GILBERT.

INDOCHINA. (1936). Rapport sur le fonctionnement de l'Institut Pasteur de Nha-Trang en 1935. **[Report of the Pasteur Institute, Nhatrang, for 1935]**. [JACOTOT, H.]—*Bull. écon. Indochine.* **39.** 551-563. [8 refs.] [Also appeared in *Arch. Inst. Pasteur Indo-Chine.* **6.** 425-427].

338,543 doses of anti-rinderpest vaccine and 79,620 doses of antiserum were prepared. 111,880 doses of vaccines and 14,900 doses of antisera for use in various other diseases were also prepared. The use of anti-rinderpest vaccine has greatly increased and also that of antiserum, although double inoculation with serum and virus is no longer used. Antisera for swine fever, swine plague and swine erysipelas are prepared. Dogs are now vaccinated with antirabic vaccine. Experiments on the treatment of SURRA were made with Bayer 205 and Forneau 309. Complete cure of horses was effected with these drugs, intramuscular injections being preferred.

Research on RINDERPEST was mostly in connexion with vaccination. Intestinal epithelium from necrotic lesions appeared to be strong in virus content. Vaccines administered intravenously had no effect. Animals withstood contact infection 3-4 days after vaccination (subcut.), and inoculation of virulent blood after 7-8 days. Experiments did not show that intradermal vaccination was superior to subcutaneous. Animals protected by vaccination against small but infective doses of virus will react later to larger doses. It is possible to some extent to titrate the potency of vaccine against injections of varying quantities of virus. To increase immunity by inoculating vaccinated animals with virus, a sufficient quantity of virulent blood should be given. Calves which have absorbed antibodies from the milk of immunized cows may be immunized with vaccine, provided that it is of sufficient strength. Vaccine has no curative value.

Experiments on diagnosis of RINDERPEST by injecting virulent blood mixed with castor oil, in a manner similar to the technique described for the diagnosis of S.F., showed this method to be ineffective [see also *V. B.* **8.** 436].—S. J. GILBERT.

CHINA. (1937). **Report of Work on Animal Husbandry and Veterinary Science at the National Agricultural Research Bureau of the Ministry of Industry, National Government of the Republic of China, for the Year 1935.** [CHENG, S. C.]—*Misc. Publ. Nat. agric. Res. Bur. Min. Agric., China.* No. 5. pp. 48-51.

Reference is made to the new laboratory of the department being erected at Nanking; until 1935 the work was carried on at the headquarters of the Epizootic Prevention Service, Kiangwan, Shanghai.

A short review of the year's work includes particulars of a SWINE FEVER survey in the Tai Hsin District, Kiangsu, and the establishment of an experimental section in the Tun Yang District, Chekiang, to educate farmers regarding preventive measures against this disease.

Research on the use of water buffaloes as serum-producing animals in the preparation of swine plague polyvalent serum indicated that an effective serum could be produced. Further work is being undertaken.—J. C. WALLACE.

BOOK REVIEWS.

RICHTER, J. [Dr med. vet. et phil., ord. Professor der Tierzucht und Geburtskunde an der Universität Leipzig.] (1938). Die Sterilität des Rindes. **[Sterility in Cattle]**. pp. 207. 92 figs. [Numerous refs.] Berlin: Richard Schoetz. [4th Edit.] [8vo] [RM.8].

During the 12 years which have passed since the publication of the last edition,

much new knowledge has accumulated, particularly on sterility in bulls, trichomonad infection and artificial insemination. This new edition has been fully re-written, with due notice of the recent literature, and is, therefore, a first-class reference and text-book, being materially aided by the many excellent photographs and photomicrographs.

It is welcomed and recommended.—J. E.

WEBER, F. A. [Dr. med., Dr. med. vet. h. c., Geh. Reg.-Rat, Präsident i. R. des ehem. Sächsischen Landesgesundheitsamtes]. (1937). Zwei Jahrhunderte Sächsisches Medizinalwesen. [**Two Centuries of Medical Work in Saxony**]. —*Veroff. Volksgesundheits.* **48.** No. 6. pp. 187. 3 tables. Berlin: Richard Schoetz. [8vo] [RM.7.50].

In his speech as President at the closing meeting of the Saxony Board of Health on March 31, 1936, the author gave a very complete summary of the history of medicine in Saxony during the past 200 years, and made mention of veterinary medicine in passing. The first German veterinary school was founded at Dresden in 1774 and in 1807 was made part of the University. The first complete veterinary course began in November, 1817 with Prof. PRINZ as Lecturer. PRINZ was a surgeon who had been sent by the Government to visit the schools of Copenhagen, London, Alfort, Munich and Vienna.

The veterinary school separated from the University in 1856 and in 1889 was created a Veterinary High School. In 1923 it became the Veterinary Medical Faculty of the University of Leipzig and was transferred to that city.

In 1838 PRINZ established a vaccine institute under the direction of Dr. PIENITZ, and in 1885 a State Vaccine Institute was founded at the Veterinary School.

The Board of Health deals not only with human medicine, but also with veterinary medicine and pharmacy, and has a department devoted to each. The renowned Dr. ELLENBERGER, Professor of Physiology at the Dresden Veterinary School, was a former President of the Board. The author himself was the last President, and gives a brief summary of the chief events of his directorate which lasted from 1890 to 1936.

The remainder of this number, pp. 28-187, contains abstracts from the important laws, ordinances, regulations, etc., relating to medicine, veterinary medicine and pharmacy, together with a list of the periodicals and a summary of the most important work accomplished in the period under review. This number will become a source of reference for all interested in medical and veterinary history in Saxony.—F. BULLOCK.

HAMMER, B. W. [Ph.D., Professor of Dairy Bacteriology, Iowa State College, and Chief in Dairy Bacteriology, Iowa Agricultural Experiment Station]. (1938). **Dairy Bacteriology.** pp. xiv + 482. 45 figs., 23 tables. [Numerous refs.] London: Chapman & Hall Ltd; New York: John Wiley & Sons Inc. [2nd Edit.] [8vo] [25s.]

This interesting and instructive book, written primarily for students of the dairy industry, takes in the whole field of dairy hygiene and dairy bacteriology, these subjects being considered from both the commercial and the public health points of view. In covering such a wide field the author has been forced to omit all detail and confine himself to general principles and, in consequence, the book is not of great use to the specialist, but it will serve as an excellent introduction to the problems which surround the production of safe, clean and agreeably tasting dairy products.

The chapters dealing with " Contamination of milk and cream and its control ", and with " Spread of diseases through milk and its derivatives ", should be of particular interest to veterinarians, and the bibliography appended to these chapters will be of great value to those wishing to study the subjects more closely.—E. J. P.

COPE, Z. [B.A., M.D., M.S. (Lond.), F.R.C.S. (Eng.); Surgeon to St. Mary's Hospital, Paddington; Senior Surgeon to the Bolingbroke Hospital, Wandsworth Common; Late Hunterian Professor, and Arris and Gale Lecturer, Royal College of Surgeons]. (1938). **Actinomycosis.** pp. xii + 248. 52 text figs., 17 figs. on 8 plates, 4 tables. [Numerous refs.] London, New York & Toronto: Humphrey Milford, Oxford University Press. [8vo] [15s.]

This is the first monograph on actinomycosis to be published in English, and although it deals principally with the disease as it occurs in man, several aspects to the subject are included which will interest both the veterinary practitioner and the comparative pathologist.

An interesting historical summary is followed by a description of the biological characteristics of the pathogenic strains of *Actinomyces*. According to C. most cases in man are due to the organism which is responsible for actinomycosis of the jaw in cattle, namely *A. bovis*, whereas there are only three reported cases of actinobacillosis in man. Occasionally, aerobic species of *Actinomyces* are found and it is interesting to note that they are often associated with generalized actinomycosis due to blood stream dissemination.

Following a general account of the clinical features and methods of diagnosis C. describes in detail the peculiarities of the infection in relation to individual organs. The cervico-facial cases comprise 56% of all cases, abdominal cases 22%, and thoracic cases approximately 15%. The jaw-bone is not commonly affected in man and in contrast to its occurrence in cattle the disease usually affects soft structures. About 3% of cases occur in the tongue, but these are caused by *A.b.*

Finally the prognosis and treatment are discussed and in relation to the latter the efficiency of such measures as treatment by drugs, radiation, vaccines, surgical interference, etc., is considered at some length.

Sufficient has been said to show that this publication, although primarily intended for the student of human medicine, is not without interest for the veterinarian. It is certainly the most up-to-date and comprehensive account of this disease in man which the reviewer has seen in English.

Great credit is due to the publishers. The paper is good, the matter is attractively presented and the illustrations well reproduced.—G. O. DAVIES.

LAW, R. G. [B.V.Sc., D.V.Sc., Director, Ontario Government Experimental Fur Farm, Kirkfield]. (1936). **The Fox in Captivity.** *Bull. Dep. Game & Fish., Ont.* No. 7. pp. 161. 35 figs., 1 plate. [6 refs.] [8vo] [$1.00].

This little book gives much useful information on a variety of subjects. It answers or discusses many questions which beset the fox breeder, for whom it is mainly intended, and contains much of interest and practical value to veterinarians who are concerning themselves with problems of the fur farming industry. The ten chapters deal with ranch construction, foods and rationing, breeding and selection, pelting, parasitic diseases, diseases of the digestive tract and kidney, and distemper. The last chapter gives short notes on such a variety of subjects as mastitis, agalactia, abortion, dentition, ulcerative inflammation of the gums, " big head ", tail chewing, obstetrics, methods of restraint, dosing with worm capsules and many routine procedures. The author has had a long experience as Director of the Ontario Government Experimental Fur Farm.—E. A. WATSON.